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Emergency Data Exchange Language (EDXL)
Requirements Statement and Draft Messaging Specification
For the
PHASE I - Tracking of Emergency Patients
(EDXL-TEP) Messaging Standard



Draft Version 2.2
05/05/2010

Precursor to Phase II:
Tracking of Emergency Clients (EDXL-TEC)
(Formerly “EDXL-TEV” – Tracking of Emergency Victims)

Prepared by Evolution Technologies, Inc.
Sponsored by the DHS S&T-OIC EDXL Program
Defined by the EDXL Practitioner Steering Group and TEP Steering Committee

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EDXL Tracking of Emergency Clients (TEC): Phase I - *Tracking of Emergency Patients (TEP)*
Requirements and Draft Messaging Specification 05/05/2010

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78
79 *The formal stakeholder review period for this document was conducted from March 1 through*
80 *March 31, 2010. Due to requests from the National Library of Medicine / National Institute of*
81 *Health, DoD Health & Medical Defense Support of Civil Authorities and others, the deadline was*
82 *extended through April 14, 2010. During review and incorporation of feedback, input from*
83 *planning and execution of a Maryland / Tennessee NDMS interoperability exercise draft TEP pilot*
84 *(April 29, 2010) was incorporated.*

85 **Related work:**

86 **This specification is related to:**

87
88 EDXL-TEP Messaging Standard Research Report & Research Artifacts – January 2009

89 <http://www.evotecinc.com/TEP/>

90
91 AHRQ - Recommendations for a National Mass Patient and Evacuee Movement, Regulating, and
92 Tracking System

93
94 EDXL-TEP Stakeholder Comments (Issues) list

95 <http://www.evotecinc.com/TEP/> (TEP-Stakeholder-IssuesRev10_02-24-2010.xls)

96
97 EDXL-TEP *Executive Summary for PHASE I - Tracking of Emergency Patients* Messaging
98 Standard V4.2

99 <http://www.evotecinc.com/TEP/>

100
101 EDXL-TEP *Project Initiation Document (PID) for the PHASE I - Tracking of Emergency Patients*
102 Messaging Standard (Prerequisite to this Specification) V4.2

103 <http://www.evotecinc.com/TEP/>

104
105 EDXL Distribution Element v1.0

106 http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE_Spec_v1.0.doc

107
108 EDXL Resource Messaging v1.0

109 <http://docs.oasis-open.org/emergency/edxl-rm/v1.0/os/EDXL-RM-v1.0-OS.doc>

110
111 EDXL Hospital Availability Exchange v1.0

112 [http://docs.oasis-open.org/emergency/edxl-have/os/emergency_edxl_have-1.0-spec-](http://docs.oasis-open.org/emergency/edxl-have/os/emergency_edxl_have-1.0-spec-os.doc)
113 [os.doc](http://docs.oasis-open.org/emergency/edxl-have/os/emergency_edxl_have-1.0-spec-os.doc)

114
115 EDXL Situation Reporting (SitRep)

116 **(Specification development currently in-progress within the OASIS Emergency**
117 **Management Technical Committee (EM-TC)) process**

118
119 Health Level 7 (HL7) Admission, Discharge & Transfer (ADT):A40 – Specifies methods for
120 merging messages to support various requirements within specific implementations.
121 (TEP information elements and structure supports this requirement by providing standardized
122 way to share patient tracking data as input to receiving application merging or processing of the
123 data.

124
125 2010 Multi-Organization NDMS Patient Reception Exercise, April 29, 2010 Memphis TN
126 Federal DHS, HHS, VA, National Guard. State of TN and MD, MIEMSS, OHS, TN DOH,
127 Memphis EM, Hospitals, and EMS

131 **Abstract:**

132

133 NOTE: The EDXL-TEP "*Project Initiation Document (PID) for the PHASE I - Tracking of Emergency*
134 *Patients Messaging Standard*" is a prerequisite to this Specification, providing background, purpose,
135 objectives, scope and EDXL overview.

136 <http://www.evotecinc.com/TEP/>

137

138 EDXL-TEP is an XML messaging standard primarily for exchange of emergency patient and tracking
139 information from patient encounter through hospital admission or release. TEP supports patient tracking
140 across the EMS incident continuum of care, as well as evacuations *from* hospitals and day to day hospital
141 patient transfers, providing real-time information to responders, emergency management, coordinating
142 organizations and care facilities involved in incidents and the chain of care and transport.

143

144 The TEP purpose embraces larger Phase II effort objectives for tracking everyone affected by and
145 requiring emergency service or assistance as a result of a mass casualty incident, but is aimed at
146 increased effectiveness of emergency medical services and management, patient tracking, and continued
147 patient care preparedness during emergency care. TEP is driven by cross-profession practitioner needs
148 (Practitioner Steering Group and expanded stakeholder groups), and led by the National Association of
149 State EMS Officials (NASEMSO). It supports select goals of the HHS-Agency for Health and Research
150 Quality (AHRQ) and gaps identified by the Health Information Technology Standards Panel (HITSP).

151

152 1 Introduction

153 1.1 Background

154 The Emergency Data Exchange Language (EDXL) practitioner requirements definition process for this
155 effort is structured in two phases (please see the EDXL-TEP "*Project Initiation Document*" (PID) for further
156 description):

157 Phase I, the purpose of this document, focuses on the *EDXL Tracking of Emergency Patients*
158 (*EDXL-TEP*). A patient in this context is a "victim" or "client" requiring medical oversight or
159 attention, being medically evaluated; or a fatality.

160 Phase II, to be initiated at a later date, expands these concepts into the *EDXL Tracking of*
161 *Emergency Clients (EDXL-TEC)* (Formerly "EDXL-TEV" – Tracking of Emergency Victims). In
162 this context a Phase II "Client" refers to tracking of everyone affected by and requiring emergency
163 service or assistance as a result of a mass casualty incident or disaster. This includes persons
164 displaced, missing, evacuated, sheltering in place, deceased, and/or requiring medical attention
165 (i.e. a patient).

166 Throughout this document the term "Client" and "Patient" are synonymous, with the term "patient"
167 predominantly and appropriately used for this standard. The term "Client" is a preliminary proposal by the
168 TEP Steering Committee as a generic term to facilitate seamless extension of concepts into Phase II.

169 1.2 Purpose

170 The purpose of this *Emergency Data Exchange Language - Tracking of Emergency Patients (EDXL-TEP)*
171 *Requirements and draft Messaging Specification* document is to expand and detail a draft design for the
172 *EDXL-TEP "Project Initiation Document (PID) for the PHASE I - Tracking of Emergency Patients*
173 *Messaging Standard*. These documents will jointly form the submission package to the public standards
174 development organization OASIS, providing the basis for creation of a public, international standard
175 through the OASIS formal process. These two documents MUST be addressed jointly as a unified,
176 comprehensive package; representing Emergency Practitioner requirements within the OASIS process
177 (see <http://www.evotecinc.com/TEP/>)

178 The EDXL-TEP "*Project Initiation Document*" (PID) is a prerequisite to this Specification, and neither
179 document is to be addressed independently. The PID defines the EDXL-TEP messaging standard
180 background, purpose, objectives, and scope, as well as an EDXL overview and various appendices.
181 Where differences exist between the EDXL-TEP PID and this Specification, this Specification shall take
182 precedence. This Specification defines comprehensive requirements and design details necessary for
183 development of an EDXL messaging standard. Information presented in the PID is not duplicated in this
184 Specification document.

185 The TEP Steering Committee helped drive development of the PID and this Requirements and Draft
186 Messaging Specification document. In order to facilitate vetting and consensus across a broad
187 stakeholder community, the document review and approval process prior to OASIS submission includes
188 the following: the TEP Steering Committee, the DHS-sponsored Practitioner Steering Group (PSG) and
189 Standards Working Group (SWG), the expanded TEP stakeholder groups, and the DHS Office for
190 Interoperability and Compatibility.

191 This Specification describes the need for an XML-standard schema for the exchange of emergency
192 patient and tracking information from the point of patient encounter through patient admission or release.
193 The TEP document supports patient tracking across the EMS incident continuum of care, as well as
194 during hospital evacuations and day to day patient transfers, providing real-time information to
195 responders and care facilities in the chain of care and transport.

196 Though requirements and inputs to this standard have been driven out through cross-profession
197 emergency support practitioners and expressed in U.S.-based language and terms, the intent of this effort
198 is to drive a public, international XML-based standard. This format is intended to be used collaboratively
199 with other EDXL standards, and may be used over any data transmission system, including but not
200 limited to the Simple Object Access Protocol (SOAP) Hypertext Transfer Protocol (HTTP) binding.

201

202 **1.3 Outstanding Issues**

203 A separate issues list (EDXL-TEP Steering and Stakeholder Comments) for the TEP project has been
204 maintained since development and distribution of the Project Initiation Document (PID). The list maintains
205 all the issues which have been opened, in-process and closed. As of this version, the vast majority of
206 outstanding issues have been addressed, incorporated and closed. However, a small number of issues
207 remain open for OASIS review and disposition. The full issues list is contained I the submission package
208 and also can be found on the following site:

209

210 [http://www.evotecinc.com/TEP/ \(TEP-Stakeholder-IssuesRev2.2_05-07-2010.xls\)](http://www.evotecinc.com/TEP/ (TEP-Stakeholder-IssuesRev2.2_05-07-2010.xls)

211 **EDXL-TEP security and privacy (see also Functional Requirement #8 below)**

212 It is known and recognized that the TEP Standard is designed to facilitate electronic transport and sharing
213 of potentially Private and Sensitive Information between systems – either through individual data
214 elements or specific combinations of elements. Therefore, any *implementation* in compliance with EDXL-
215 TEP (“data in transit”) and sending and receiving systems (“data at rest”) MUST adhere to applicable
216 Health Insurance Portability and Accountability Act (HIPAA), Health Information Technology for Economic
217 and Clinical Health Act, and Personally Identifiable Information (PII) requirements. Examples include
218 those cited in the National Institute of Standards and Technology (NIST) Guide to Protecting the
219 Confidentiality of Personally Identifiable Information; as well as other privacy requirements as applicable.
220 Sensitive information and privacy issues and requirements SHALL be addressed by applying appropriate
221 existing compliance documentation, directives, policy and procedure in context of emergency and
222 disaster situations.

223

224 To the extent possible, EDXL-TEP and its routing mechanism, the EDXL-Distribution Element (EDXL-
225 DE), will provide metadata to assist with privacy and security designation and handling.

226

227 EDXL Distribution Element v1.0

228 http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE_Spec_v1.0.doc

229

230 The TEP Standard specifies only a standard *format and structure* used as a compliance specification to
231 carry data, but ultimately does not directly address PII data requirements. Individual system
232 implementations must address and satisfy PII requirements. Therefore, the TEP Standard does not in
233 itself address sensitive information and does not fall under any HIPAA, PII or other privacy requirements.

234

235 1.4 Document Structure

236 This document is organized into two major sections, which MUST be considered in whole as well as
237 jointly with the PID within the OASIS process as the primary drivers of the standard.

238 1. EDXL-TEP Requirements Section

239 The Requirements section provides overall context and specifies the scope and traceable
240 requirements which MUST be met in order for the resulting standard to meet the needs of the
241 emergency response and communications, and disaster management practitioners.

242 Requirements are organized in to the following sections:

- 243 a. General Requirements
- 244 b. Functional Requirements
- 245 c. Information Requirements
- 246 d. Conformance Requirements

247

248 2. EDXL-TEP Draft Messaging Specification Section

249 Though the final OASIS product will reflect improved and more detailed modeling and definition,
250 this section provides a logical graphic and tabular representation of the standard message
251 requirements, information needs and definitions, attributes (such as cardinality) and relationships.

252 This section is organized into:

- 253 a. TEP Required Elements Model
- 254 b. TEP detailed Element Reference Model (ERM)
- 255 c. TEP Common Elements Model
- 256 d. Data Dictionary

257

258 3. Appendices

259 Appendices in this document contain a glossary, definition of key terms, and the list of
260 outstanding issues for easy reference. Please refer to the appendices contained in the EDXL-
261 TEP PID document for additional background and references.

262 1.5 Terminology

263 Appendix B provides a glossary of acronyms while Appendix C provides definition of some key terms.

264 This terminology section provides guidance in the development and understanding of TEP requirements
265 statements contained in section 2.5 of this document.

266

267 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD
268 NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described
269 in [\[RFC 2119\]](#).

270 The term "Conditional" as used in this specification is to be interpreted that a message *element* MUST be
271 used, according to specified rules (elements MUST be one of "Required," "Optional" or "Conditional").

272

273 RFC 2119 specifies:

274 1. MUST This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute
275 requirement of the specification.

276

277 2. MUST NOT This phrase, or the phrase "SHALL NOT", mean that the definition is an absolute
278 prohibition of the specification.

279

280 3. SHOULD This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in
281 particular circumstances to ignore a particular item, but the full implications must be understood and
282 carefully weighed before choosing a different course.

283
284 4. SHOULD NOT This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid
285 reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full
286 implications should be understood and the case carefully weighed before implementing any behavior
287 described with this label.

288
289 5. MAY This word, or the adjective "OPTIONAL", mean that an item is truly optional. One vendor may
290 choose to include the item because a particular marketplace requires it or because the vendor feels that it
291 enhances the product while another vendor may omit the same item. An implementation which does not
292 include a particular option MUST be prepared to interoperate with another implementation which does
293 include the option, though perhaps with reduced functionality. In the same vein an implementation which
294 does include a particular option MUST be prepared to interoperate with another implementation which
295 does not include the option (except, of course, for the feature the option provides.)

296

2 EDXL-TEP Requirements

297

2.1 EDXL-TEP Definition Process

298

299

300

301 The EDXL-TEP PID along with this EDXL-Tracking of Emergency Patients (TEP) “*Requirements and*
302 *Draft Messaging Specification*” was created according to the process and background described in the
303 PID. Content of previous and current efforts captured in the “EDXL-TEP Messaging Standard Research
304 Report & Research Artifacts – January 2009” was utilized to develop straw-man documentation, which
305 was then refined and expanded by the TEP Steering Committee, Practitioner Steering Group (PSG),
306 Standards Working Group (SWG), TEP stakeholders, and vendors through requirements development,
307 analysis, scenario / use case sessions and iterative reviews.

308

2.2 Standards Compatibility

309 The TEP Standard MUST be compatible with the following existing standards, policies or practices.
310 “Compatibility” in this context means that formats are compatible or can be referenced, e.g. existing
311 managed lists, in order to facilitate broad interoperability and leverage current efforts.

312

313

- 314 • The OASIS EDXL family of standards including the EDXL-Distribution Element, Resource
315 Messaging (RM), Hospital aVailability Exchange (HAVE), Common Alerting Protocol
316 (CAP), and the currently under OASIS review EDXL-Situation Reporting.
 - 317 ○ Where decisions are made to address equivalent requirements using methods or
318 elements different from previous EDXL standards, then OASIS must develop and
319 pursue an action plan for new versions of existing standards for consistency with
320 future decisions or trends.
- 321 • NIEM – National Information Exchange Model. The OASIS process SHALL research and
322 re-use NIEM elements where an existing NIEM element precisely meets the requirement.
- 323 • NIMS – National Incident Management System
- 324 • NEMSIS – National EMS Information System. The OASIS process SHALL research and
325 re-use NEMSIS elements where an existing NEMSIS element precisely meets the
326 requirement.
- 327 • HL-7 – Health Level 7 specifications where applicable to facilitate understanding of the
328 information.
- 329 • HITSP – Health Information Technology Standards Panel - EDXL standards are "gap
330 fillers" of many HITSP ER-EHR process.
- 331 • Health Insurance Portability and Accountability Act (HIPAA)
- 332 • Health Information Technology for Economic and Clinical Health Act, and Personally
333 Identifiable Information (PII) requirements, such as those cited in the National Institute of
334 Standards and Technology (NIST) Guide to Protecting the Confidentiality of Personally
335 Identifiable Information; as well as other privacy requirements as applicable.

336

337 **2.3 TEP Message and Actors**

338 The following provides a general definition of the TEP standard message, and lists typical actors; general
 339 types of senders and receivers of TEP messages.

341 *Table 1 – TEP Message Definition*

342

MESSAGE NAME	MESSAGE WRITTEN DEFINITION	SENDERS	RECIPIENTS
Tracking of Emergency Patients	The TEP message is a single EDXL message that is intended to facilitate the pro-active sharing of EMS Provider, Patient Location, Incident, Patient Demographic, and Patient Care information as warranted to provide better patient care and preparation by facilities that will eventually provide ongoing and post-emergency care. This message addresses TEP requirements in a “data-driven” mode. Users may create or update data based on key events in the field. Any change will be captured and then shared via the TEP messaging standard according to local standard operating procedures and or implementation decisions. A TEP message may be sent if one and only one element is changed, or if a group of elements changes and are sent in compliance with the standard.	EMS Providers, ED, Intermediate Care Facilities, Federally deployed care providers (NDMS, National Guard, etc.), "forwarders" of this information to others.	EMS Providers, Emergency Department, Intermediate Care Facilities, Hospitals, Emergency Dispatch, Emergency Operations Center, Incident Command Center, Emergency Management (other), Law Enforcement, Federally deployed care providers (NDMS, National Guard, etc.),

343
344

345 **2.4 EDXL TEP Scenarios and Use Cases**

346 The EDXL standards development process utilizes scenarios and use cases to drive out and/or confirm
 347 detailed requirements and message design. A *scenario* describes a potential incident or set of events
 348 and its response, step by step over time. The scenario is used to demonstrate application or typical uses
 349 of the Messaging Standard from an end-user perspective. A *use case* describes a sequence of actions
 350 performed by each actor representing some potential uses of the Standard within the scenario. The
 351 process drives out requirements and information that needs to be exchanged. Existing documents, forms,
 352 and other materials were also used in the development of use cases.

353 Because of the in-depth past work performed in the area of Patient Tracking, the TEP analysis effort
 354 focused primarily on detailed use cases given that TEP messages must apply to any type of incident or
 355 hazard of any scale.

356 Initial result of this process yielded a TEP “multiple messages” structural design, similar to the OASIS
 357 EDXL-RM standard which specifies multiple standardized messages. Ongoing sessions and testing of
 358 the need for multiple message structures was conducted by exploring process drivers, use case and
 359 event-driven analysis, and needs of the “actors” in the field. This process resulted in findings and the
 360 recommendation that TEP be defined as a single “message structure” (a single Element Reference
 361 Model), that addresses TEP implementation requirements in a “data-driven” mode. TEP is intended
 362 purely as a standard to provide electronic information flow which today is provided via radio, through non-

363 standardized electronic methods, or not provided at all prior to hospital admission. Users will create or
 364 change data in the field as driven by process, events, and circumstances. Changes are captured and
 365 then shared in compliance with the TEP messaging standard according to local standard operating
 366 procedures (SOP's) and implementation decisions.

367 Along the path to proposing a single message-structure solution, the group took into consideration overall
 368 message design and usage complexity, standardization of processes, and SOP's across EMS, hospital,
 369 emergency management, and other communities both nationally and internationally. Where the need or
 370 desire exists to route multiple independent TEP messages at the same time, this is facilitated using the
 371 routing mechanism such as the EDXL-Distribution Element (DE).

372 **2.4.1 TEP Scenario and Use Case Variables**

373 While not an all inclusive list, the following variables were considered, tested and built into the use case
 374 analysis for TEP.

Table 2 – TEP Variables

375
376

Variables	Variable Types
Event	Every day individual patient encounter, MCI
Hazard Type	Chemical, Radiological Incident, Natural Disaster, Day to Day (Car Accident), Pandemic, Biohazard, Explosives
Response	Single Jurisdiction, Multi-Jurisdictional, Federal Resource Activation
Dispatch	Day to Day, EMS Dispatched to Incident
Medical Evacuation	Bomb Threat, Fire, Biohazard, Loss of Power/HVAC, Natural Disaster, Work Stoppage, Interstate Patient Evacuation
Patient Presentation Location	Scene, Intermediate Care Facility,
Patient Presentation	EMS Provider found, Self-Present, Non-EMS found
Responder/Care Provider	EMS Provider, Non EMS, ED Physician/Nurse
Patient Condition	Responsive, Unresponsive, Deceased
Transportation	Ambulance, Air, Boat, Police/Fire, Private Vehicle, On Foot, Train, Ground transportation procured by public safety
Intermediate Care Facilities	ER, Field Hospital, Triage Area, Alternate Care Facility, State-sponsored intermediate care facilities
Disposition	Hospital, Morgue, Released, Shelter
Initial Patient Presentation Area	Scene, Triage Area, Intermediate Care Facility, Federal Medical Station

377
378

379 **2.4.2 TEP Representative Use Case List**

380 The following scenarios / use cases were used as a basis for development of the EDXL TEP
 381 Requirements and draft Messaging design. Though these Use Cases do not fully describe application of
 382 the TEP message components, they were used to test the message design to ensure that design
 383 supports each Use Case and triggering event. This list provides a representative sample, questioning
 384 "what if" this or that occurs..., and represents a sub-set of the total used to analyze and test requirements
 385 and draft message design. This list is therefore not intended to provide exhaustive examples of TEP
 386 usage, and may not fully reflect actual practices.

387 See also Section 2.5.3 Information Requirement #24 for additional Use Cases.

388

Table 3 – TEP Use Case List

UC #	Scenario / Use case	Description
1	"Patient" evaluated and determined not to be a patient	"Patient" determined not to need medical attention. Minimal information collected, "patient" released to go home
2	"Patient" evaluated and determined not to be a patient, evacuated	"Patient" determined not to need medical attention. Minimal information collected, "patient" evacuated to a temporary shelter via school bus
3	EMS treated and released on scene	EMS treated and released on scene
4	Patient treated by EMS and transferred to ED	Patient treated by EMS and transferred directly to ED
5	Patient Self Present at ED	Patient Self Present at ED
6	Patient Self Present at Field Hospital/Intermediate Care Facility	Patient Self Present at Field Hospital/Alternate Care Facility, transferred to ED
7	Patient Self Present at Temporary Shelter with no Medical personnel	Patient Self Present at Temporary Shelter, assessed as "sick" by a volunteer who calls EMS. EMS arrives, treats the patient, and transferred to ED
8	Patient transported via private vehicle to ED	Patient transported via private vehicle directly to ED
9	Patient transported by non-EMS Responder to ED	Patient transported by non-EMS Responder directly to ED
10	Patient transported by non-EMS Responder to Field Hospital/Intermediate Care Facility	Patient transported by non-EMS Responder to Field Hospital/Intermediate Care Facility, then to ED
11	Patient treated by EMS and transferred to Field Hospital/Intermediate Care Facility, then to ED	Patient treated by EMS and transferred to Field Hospital/Intermediate Care Facility, then to ED
12	Patient treated by EMS, transferred through multiple locations	Patient treated by EMS, transferred to staging area, transferred to field hospital receiving further treatment, transferred to ED, admitted to hospital
13	Patient transported to ED by EMS, then transferred to a Specialty Treatment Center	Patient transported to ED by EMS, then transferred to a Specialty Treatment Center
14	Patient self presents at Urgent Care, then transferred to ED by private vehicle	Patient self presents at Urgent Care, then transferred to ED by private vehicle
15	Patient self presents at Urgent Care, then transferred to ED by ambulance	Patient self presents at Urgent Care, then transferred to ED by ambulance

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16	Patient self presents at Urgent Care, then released	Patient self presents at Urgent Care, then released
17	Patient treated by EMS and released, then self presents at ER	Patient treated and released by ER at scene, then self presents at ED later in the day.
18	Patient treated by EMS, transferred to ED, leaves without release	Patient treated by EMS, transferred to ED, leaves without release, returns to another ED for further treatment
19	Patient treated by Search and Rescue, transported to Intermediate Care Facility by non-EMS	Patient is found by Search and Rescue Team, receives treatment, and is transported to Intermediate Care Facility by S&R support staff.
20	All passengers on plane quarantined	TSA officials are notified that a passenger on an incoming flight from China is a carrier of Avian Bird Flu, Federal officials set up quarantine for all passengers.
21	MCI- Triage operated by NDMS representatives	An MCI has occurred, a triage area and field hospital is set up and operated by NDMS staff
22	MCI- Search and Rescue finds deceased	Search and Rescue finds deceased, local medical examiner transports from scene to morgue.
23	MCI- Triage area run by National Guard medics	A triage area is set up at an MCI by National Guard personnel and victims are triaged by National Guard medics, patients then transported to civilian hospitals by NG personnel
24	Ferry capsizes	A ferry capsizes in Puget Sound. Responders include Sheriffs Dept, Fire, Coast Guard
25	Plane crash in remote area	Plane crashes in the Everglades/Mountain Range, with survivors, responders include Sheriffs Dept, Fish and Wildlife Officers, Search and Rescue. Remote area prohibits EMS access. Some patients receive treatment upon contact. All patients air lifted or by ATV to staging areas.
26	Multiple stops before fixed medical facility	Patient admitted to local, ER, transferred to level 1 trauma facility, then to burn center
27	Homebound uninjured person evacuated by EMS to a shelter	Homebound uninjured person evacuated by EMS to a shelter due to a hurricane approaching
28	Hospital Evacuates Hospital Patients due to Hurricane warning	Hurricane is approaching Miami and multiple hospitals are evacuated
29	Nursing Home Evacuates residents Patients due to Hurricane warning	Hurricane is approaching Miami and multiple nursing homes are evacuated
30	Prison Evacuates inmates due to Hurricane warning	Hurricane is approaching Miami and multiple Prisons are evacuated
31	Hospital to Hospital Transfer	Patient transferred from one hospital to another
32	Transfer from hospital to nursing home/rehab center	Patient is transferred from a hospital to a nursing home or rehabilitation facility

33	911 dispatch to day to day incident	911 receives call of person having heart attack, personal information is collected by 911
34	Hospital Evacuated to NDMS station	A hospital is evacuated to a National Disaster Medical Station
35	ED requests Electronic Monitoring/Sensor Data	The Emergency Department Dr. Requests Electronic Monitoring data from EMS that treated the patient
36	Request is made to access Electronic Health Record	An Emergency Department Dr. makes a request for a patients Electronic Health Record
37	MCI patient transferred to a state-sponsored triage area	Many states have MCI strike teams. The patient is transferred to a triage area operated by state sponsored resources prior to release or transfer to hospital

390

391 **2.4.3 TEP Use Case “Events / Triggers”**

392 The following list represents “business events”, circumstances, and/or operating procedures which drive
 393 creation or change to relevant information, potentially triggering the need for a TEP message. This list
 394 was derived from further Use Case testing to ensure that the TEP message supports key triggering
 395 events, individually or in combination, in the field and other points along the EMS incident continuum of
 396 care.

397

398

Table 4 – TEP Primary Use Case “Events / Triggers”

Key Events That Trigger Messages	Description
<i>Responders dispatched</i>	PSAP / dispatch center dispatches responders to an incident. Possible starting point for sharing of incident and patient data
<i>Patient Encountered</i>	The first or initial meeting or contact between a given care provider and a given patient.
<i>Patient Evaluated or Triageed</i>	Medical observation, measurement, and assessment of a patient or possible patient
<i>Patient Treated</i>	Medical performance or administering of procedures, medications, or other treatments.
<i>Patient moved/ transported (physical location tracking)</i>	Patient is physically moved from one location, site, or facility to another
<i>Patient being transferred to new care provider</i>	Patient care responsibility is transferred from one care provider to another
<i>Patient condition changes</i>	Patient health / medical condition changes in some way
<i>Patient vitals and monitoring taken</i>	Care Provider takes vital signs or other measurements, typically using various monitoring

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	equipment, some of which may be electronic
<i>Patient Released</i>	Patient is released from care, and is no longer considered to be part of the EMS incident continuum of care, and is no longer tracked using TEP
<i>Patient Admitted</i>	Patient is formally admitted into a fixed medical facility or a temporary deployable facility capable of providing definitive care, which typically involves transfer of Care Provider and physical location.
<i>Patient ID information updated</i>	Further identifying information is collected / shared about the patient
<i>Time-driven information i.e. transfer to AHRQ National Database</i>	Patient Tracking information is automatically or manually shared with a National Database used for consolidated tracking of patients and clients
<i>Change in conditions requiring patient reroute (change in patient condition, receiving facility full)</i>	Change in circumstances requiring patient transport to re-route from current destination to a new destination

399

400

401 2.5 EDXL-TEP Statement of Requirements (Normative)

402 The Requirements section of this document specifies both the general focus and detailed, specific and
403 traceable requirements which **MUST** be met in order for the resulting standard to meet the needs of the
404 emergency response and disaster management practitioners. Requirements are organized into the
405 following sections. Requirements within each section are numbered to support tracing to the final
406 product.

- 407 • **“General Requirements”** are overarching.
- 408 • **“Functional Requirements”** are functional capabilities that the messaging standard must
409 support or facilitate.
- 410 • **“Information Requirements”** define the information needs that the messaging standard
411 must support in terms of elements, relationships or business rules.
- 412 • **“Conformance Requirements”** define rules that must be followed to guide testing of the
413 standard and implementation conformance.

414 Though the intent of this section is to comprehensively convey all project requirements textually, the
415 models and data dictionary presented in Section 3.3 and Section 3.4 provides further clarification and are
416 considered normative. These sections **MUST** be consulted in concert the Statement of Requirements in
417 order to ensure a complete understanding of the full requirement (e.g. element definitions).

418 Though requirements and inputs to this standard have been driven out through cross-profession
419 emergency support practitioners based across the U.S., the intent of this effort is to drive an international,
420 public XML-based messaging standard

421

422 **2.5.1 General Requirements**

423 General requirements are simply overarching requirements that apply across the TEP messaging
 424 standard.

425 **Table 5 – EDXL-TEP General Requirements**

EDXL-TEP General Requirements	
Rqmt #	Requirement
1.	<p>This <i>Requirements Statement and Draft Messaging Specification for the Tracking of Emergency Patients Messaging Standard (EDXL-TEP)</i>, is part II of a two-section submission to OASIS. Part I of the submission is the <i>Project Initiation Document (PID)</i>, which is a mandatory component and prerequisite to the <i>EDXL-TEP Requirements and draft Messaging Specification</i>. All specification details MUST be guided by and fall within the <i>PID</i> context, objectives and scope. Information contained in the <i>PID</i> is not repeated in this specification.</p> <p>Both the <i>EDXL-TEP Project Initiation Document (PID)</i> and the <i>EDXL-TEP Requirements and draft Messaging Specification</i> MUST be considered in whole without exclusions within the OASIS process. All requirements and concepts captured herein must be supported and the final product (the OASIS public standard) mapped to these requirements and information needs as proof, in order to meet the full intention and requirements of the practitioner community.</p>
2.	<p>EDXL messaging - Requirements herein agreed upon by the EDXL Practitioner Steering Group (PSG), Standards Working Group (SWG), extended Stakeholder community for TEP, DHS-OIC and EIC, SHALL be used to develop a public XML-based messaging standard.</p>
3.	<p>Functional Areas – TEP MUST support the Functional / Business Process domains of emergency response and disaster management, supporting incident management stages of preparation, response, and management.</p> <p>Within these incident management stages, TEP through standardized information-sharing MUST support patient tracking and emergency business processes across the emergency continuum of care from initial Patient Encounter until Patient release, hospital (or fixed medical facility) admission, or morgue admission (Note that an Emergency Department is considered part of this continuum). This also includes support to hospital evacuation processes (patient evacuations), and day to day individual patient transfers.</p>
4.	<p>All Hazards – TEP MUST support emergency/disaster response & management processes for all types of hazards. For example, facilitate sharing of patient tracking and care information in response to a heart attack, a local car crash, a major hurricane, a pandemic influenza outbreak, or a CBRNE event.</p>
5.	<p>Incident scale – TEP MUST support patient information-sharing for all hazards of any scale, from local, day to day up to state or federally declared major disasters / mass casualty situations. A TEP message must be sufficiently “light” to foster day to day usage, by requiring through definition of the minimum number of required elements which meet priority information needs and message / data structure integrity.</p>
6.	<p>International focus – TEP MUST support patient information-sharing within and across local, tribal, state, federal and non-governmental agencies, private sector organizations, other</p>

stakeholders, host nations, and systems providers across the globe.

7. Current systems – TEP MUST facilitate patient tracking information-sharing without requiring significant changes to existing or planned systems / database structures which normally perform patient tracking functions; through standardized information-sharing between those disparate systems. TEP must enable cross-system send and receive of TEP information between disparate software systems and applications, and enable presentation and processing of that information natively through TEP standard element are mapping to existing system elements.
8. Redundant data entry – TEP SHALL facilitate the minimization or elimination of redundant data entry (“re-keying” of information) for patient tracking, with the objective of reducing errors related to manual data entry; maximizing the utilization of emergency response and healthcare resources, and saving invaluable time.
9. National Emergency Medical Services Information System (NEMESIS) Compatibility – Where feasible and appropriate, message elements and definitions MUST re-use NEMESIS documented taxonomy and definitions (NEMESIS v 2.2.1).
10. EDXL compatibility - Where requirements herein reflect equivalent concepts and elements in other current and upcoming EDXL standards, OASIS MUST apply methods which are consistent and compatible with those EDXL standards. However, where alternative methods are chosen to pursue future direction or trends, OASIS MUST develop and pursue an action plan for new versions of existing standards to ensure consistency and ongoing “interoperability” of use between all applicable EDXL standards.

426

427 **2.5.2 Functional Requirements**

428 Functional Requirements provide functional capabilities and what the messaging standard must support
 429 or accomplish.

430 **Table 6 – EDXL-TEP Functional Requirements**

<i>EDXL-TEP Functional Requirements</i>	
Rqmt #	Requirement
1.	TEP Routing - EDXL-TEP MUST be specifically designed as a payload of the OASIS EDXL-Distribution Element , or other routing mechanism used to distribute EDXL-TEP content IF the required routing header metadata is provided in the same form, or if the sender specifies specific recipients of the payload.
2.	Patient Tracking Business Processes Supported – TEP SHALL facilitate improved capabilities and increased effectiveness of key business processes across the Emergency Medical Services (EMS) incident continuum of care and supporting processes. Process improvement shall be realized through implementation of TEP standard information-sharing which supports and/or reports on the following Emergency Medical processes and events: <ul style="list-style-type: none"> • Overall emergency management and cross-organization coordination • Emergency Medical Management • Emergency Medical Medical Services (EMS) and care – TEP must support Patient tracking from the point of an EMS-certified Care Provider Encounter through the EMS incident

continuum of care to an “end-point” at Patient release, hospital (or fixed medical facility) admission, or morgue admission. The Emergency Department (ED) is considered to be within and an end-point to this continuum.

- Patient tracking from/to all “intermediate care” facilities and sites (e.g. triage sites, mobile / temporary hospitals within this continuum
- Tracking Patients that ‘self present’ at any point in the EMS incident continuum of care, including ED’s.
- Day to day transfers - Patient tracking during day to day transfers from the hospital or other fixed or temporary medical facilities to other hospitals and fixed or temporary medical facilities.
- Hospital evacuations - Patient tracking during emergency / disaster evacuations, tracking each Patient transfer from the hospital, fixed, or temporary medical facilities to any designated receiving facility.
- Hospital and Emergency Department planning and preparation for incoming Patient immediate and ongoing care
- Family Notification and reunification through sharing of Patient identification and location information

3. Patient tracking – TEP MUST provide the information required to facilitate tracking the current location of a Patient at any point in time, whether stationary or during transit (i.e. through GPS-driven location elements associated with either the Patient themselves, and/or the Vehicle being used to transport the Patient (land, air and marine vehicles). TEP MUST provide location information required to plot Patient location and movement on maps and in mapping applications.

4. TEP Message relationships: Receiving Systems – During an incident, multiple TEP messages may be sent by multiple Care Providers about each patient. The TEP structure (Elements, sequence, identifiers, relationships, cardinality and business rules) MUST meet the information-sharing requirements specified herein in a way which facilitates ease of receiving system or database “re-construction” of Patient history from initial encounter through all Care Providers and intermediate locations.

It is understood that how TEP data is accumulated, aggregated, compiled, stored and used by receiving systems and applications is determined by implementation decisions. Each TEP message is intended to pass a set of information about one patient at a point in time, and multiple TEP messages may be sent about a given patient during emergency response and care. End applications may support varied purposes such as ascertaining current patient condition, tracking running history of changes of each element or set of elements like changes in vital signs over time, tracking history of patient movement and care “records” received (keeping each individual record for history), or consolidation of the most up to date data elements for that patient (“aggregate” a patient file which represents just the most recent data for each element). It is likely that receiving systems will perform a combination of all these things and more in their database / applications.

These applications will key on the Patient, using the unique Patient ID(s) plus other descriptive information available through TEP messages to put together the history or “picture” of the Patient along the full EMS incident continuum of care.

At a minimum, the TEP Standard structure MUST not introduce any deterrents to Requirement #4 system information-sharing and receiving system use and processing.

The TEP standard must support information-sharing which supports the following receiving-System / Application use cases:

- A. Hand-held field device receives each TEP message associated with a given incident(s), and maintains one current consolidated record for each Patient with their basic health

data and triage status

- B. Re-use of previous TEP message data to create a new TEP message - e.g. where several Patients are associated with the same incident and Care Provider. Using a hand-held in the field, Care Provider uses data from a previously sent TEP message (originally sent by self or another Care Provider) as the starting point to revise and create a new TEP message for a new Patient.
- C. Emergency Departments and Hospitals continuously receiving TEP messages organize and store each individual TEP message / record associated with each Patient as a time-stamped history of all messages / updates received over time, with all associated TEP information. The application also stores a history of changes of each TEP element to track changes in patient observations and measures such as blood pressure.
- D. Emergency Departments and Hospitals continuously receiving TEP messages organize and store a consolidated history of each TEP message / record associated with each Patient including all associated TEP information. The application also consolidates one "snapshot" TEP patient record containing the most recent data values for each element.
- E. A state emergency management office receives TEP messages and automatically compiles Patient statistics such as number of Patients within a physical area over a time period by incident type, number of emergency Patients transported by Care Provider to each fixed medical facility, average time from initial encounter to fixed medical facility, and many others.

5. The TEP message structure MUST be capable of carrying data originating from various medical monitoring equipments as applicable to specified elements, such as temperature or pulse rate from a monitoring device.

6. Requirements met by other EDXL standards - EDXL-TEP requirements and information needs MUST be evaluated to determine where within the EDXL family certain requirements are best addressed (i.e. within the TEP payload, in the EDXL-DE, or elsewhere).

Where it is determined that required information need best fits in the DE, a strategy SHALL be developed and presented to the TEP Steering Committee detailing the timing and approach to address dependencies.

Specifically for TEP, the OASIS EM-TC SHALL consider use of the following EDXL-DE elements or capabilities in order to satisfy these TEP information requirements. Details are contained in the "Information Requirements" section.

- Type / purpose of the message (distributionType)
- messageSender (senderID & senderRole)
- dateTime message is sent (dateTimeSent)
- IncidentType
- Ability to share additional XML and non-XML content associated with the TEP message, such as photograph, fingerprints, Patient Electronic Health Record, or additional care elements from data standards such as NEMESIS.

7. Reference to code lists and other external information - TEP design MUST provide the ability to reference external tables or lists for specifying or referring to certain data or content where appropriate (using ValueListURN / Value)

Examples: incidentType, ageUnits, triageStatus, eyeColor and others.

8. Private and Sensitive Information Exchange – Because the TEP Standard is designed to facilitate electronic transport and sharing of potentially private and personal information – either through individual data elements or specific combinations of elements - any *implementation* in compliance with TEP MUST adhere to applicable Health Insurance Portability and Accountability

Act (HIPAA), Health Information Technology for Economic and Clinical Health Act, and Personally Identifiable Information (PII) requirements such as those cited in the National Institute of Standards and Technology (NIST) Guide to Protecting the Confidentiality of Personally Identifiable Information; as well as other privacy requirements as applicable. Sensitive information and privacy issues and requirements SHALL be dealt with by applying appropriate existing compliance documentation, directives, policy and procedure.

NOTE 1: Please see the EDXL-Distribution Element specification for a routing structure recommendation which carries metadata to assist with privacy designation and handling (such as “combined confidentiality” element).

NOTE 2: The TEP Standard simply specifies the standard format and structure used as a compliance specification to carry PII data, but does not directly address PII data in any way. Individual system implementations must satisfy PII requirements. Therefore, the TEP Standard does not in itself address sensitive information and does not fall under any HIPAA, PII or other privacy requirements.

9. TEP Conformance - Specific TEP standard conformance requirements MUST be developed and published in the final OASIS EDXL-TEP standard.

10. EDXL standards re-use and coordination – The EDXL-TEP standard MUST maintain consistency with existing OASIS EDXL standards in the support of equal or equivalent concepts and requirements. Where common concepts and elements are changed or handled in a different way from existing EDXL standards, a specific and well-communicated plan and timeline MUST be developed to maintain EDXL standard consistency and ability to work together.

11. Message Types / specification of multiple messages – All specific message types identified during the requirements process were determined to be met by the EDXL-Distribution Element (EDXL-DE) “DistributionType” values:

- a. Report - New information regarding a Patient / tracking activity.
- b. Update - Updated information superseding a previous message.
- c. Cancel - A cancellation or revocation of a previous message.
- d. Request - A request for patient information.
- e. Response - A response to a previous request.
- f. Ack - Acknowledgment of receipt of an earlier message.
- g. Error - Rejection of an earlier message (for technical reasons).

Therefore this standard SHALL NOT specify multiple individual TEP message structures (i.e. like the “transaction-based” messages identified within the Resource Messaging standard). These requirements and draft specification is submitted to OASIS with the intention of defining the resulting Standard as one overall reference schema, unless a specific proposal with justification for multiple message specification is submitted to and approved by the TEP Steering Committee.

Additional Background: The practitioner process early on resulted in the definition of multiple message structures, each providing a specific function or support to a specific process step along the EMS incident continuum of care. However, detailed scenario and use case testing resulted in findings and the recommendation that TEP be defined as a single “message structure” (a single Element Reference Model), that addresses TEP implementation requirements in a “data-driven” mode. TEP is intended purely as a standard to provide electronic information flow which today is provided via radio, through non-standardized electronic methods, by using paper based patient logs, or not provided at all prior to hospital admission. Users will create or change data in the field as driven by process, events and circumstances. Changes are captured and then shared in compliance with the TEP messaging standard according to local Standard Operating Procedures (SOP’s) and implementation

decisions.

12. TEP Conformance Requirements

- A TEP Constraint Schema or Profile **MUST** not become a new or additional messaging “standard” (another TEP “version”). It is simply a more constrained version of an *existing* messaging standard.
- A TEP Constraint Schema or Profile **MUST** not become a new or additional messaging “standard” (another TEP “version”). It is simply a more constrained version of an *existing* messaging standard.
- A TEP Constraint Schema or Profile message **MUST** comply with the OASIS TEP standard.
- A TEP Constraint Schema or Profile message **MUST** *always* validate against the OASIS TEP standard Schema.
- A TEP Constraint Schema or Profile message **MUST** validate within the OASIS TEP standard namespace with no changes to root elements.
- A TEP Constraint Schema or Profile message **MUST** use all required elements (i.e., no deletion of required elements are allowed).
- A TEP Constraint Schema or Profile message **MUST** not change attributes for required fields.
- A TEP Constraint Schema or Profile / message **MUST NOT** be a Proprietary Format.
- A TEP Constraint Schema or Profile message **MAY** further constrain the TEP standard.* (* may be thought of as a “constraint Schema” against the standard)
- A TEP Constraint Schema or Profile message **MAY** add to required element definitions.* (* only to extend or interpret the definition)
- A TEP Constraint Schema or Profile message **MAY** limit the size of required elements.

A TEP Constraint Schema or Profile message **MAY** exclude optional elements.

13. Linking of TEP data to Patient (Client) – TEP **MUST** maintain structure and necessary identifiers to facilitate receiving systems ability to receive multiple TEP messages about a given patient, and associate that data with one unique patient, considering the fact that during a mass casualty, one jurisdiction may assign a “unique” identifier, while another jurisdiction (perhaps receiving evacuated patients) may assign a different ID to the same patient. TEP **MUST** have the ability to carry multiple patient identifiers for each patient, and carry a minimum set of additional elements to assist personnel and receiving systems unique identification of each patient and their associated tracking information.

14. Functional sequence of Patient Tracking messages – OASIS shall investigate and analyze scenarios or situations where step by step tracking of patients and managing most current patient messages / records could become “out of synch”.

Example 1: Capture of multiple patient encounters, updates, and movements which normally result in multiple TEP messages, where circumstances or lack of connectivity prevent sending of the messages in “real time”. When connectivity is established, multiple TEP messages for the same patient are sent.

Example 2: During the NDMS exercise draft TEP interoperability pilot, vendors did not follow the sequence of scenario steps defined. In one case, a step 3 patient tracking event began handheld scanning and capture of patient arrival at a new destination, BEFORE TEP messages for the previous event were received which captured patients current location and departure. Because the vendors in the pilot simplified by using only a system dateTime stamp to track messages, these messages as well as the patient current location became out of sequence

(some showed still at the departure site “BWI” though physically they had been transported and were currently in Memphis).

Though the project team and Steering Committee foresee no way this could happen in a real-life situation, coupled with appropriate use of TEP message actual dateTime elements, OASIS shall further test this assumption.

15. During EDXL-TEP piloting during the National Disaster Medical System (NDMS) live exercise April 29, 2010 in Memphis, TN, An HHS requirement was noted regarding handling of “NDMS patients”. During emergencies and mass causality situations, patients who are veterans or hold other applicable designations are identified and handled / routed differently than other patients.

HHS requested that EDXL-TEP carry a flag, element or other designation designating an “NDMS patient”. This designation is determined through current process and procedures, and TEP need only carry the result of that decision process.

431

432 **2.5.3 Information Requirements**

433 Information Requirements define the information needs that the messaging standard must support in
 434 terms of elements, relationships, cardinality (one or many of a given element or group of elements),
 435 optionality and business rules. Table 7 below also TEXTUALLY describes the Element Reference Model
 436 (ERM) contained in Section 3.3.2 of this specification.

437 Textual descriptions of these TEP models may be found by referring to Section 2.5.3, “Information
 438 Requirements”. Requirements #7 to #14 describe Information needs in terms of the data elements
 439 required. Requirements #15 to #20 describe relationships of the various data within the message
 440 structure (represented by lines between blocks). Finally, Requirements #21 to #23 describe information
 441 needs in terms of the supporting data elements required.

442 See the data dictionary for detailed element definitions.

443

444 **Table 7 – EDXL-TEP Information Requirements**

<i>EDXL-TEP Information Requirements</i>	
Rqmt Number	Requirement
1.	<p>Patient Tracking Information-types – TEP SHALL facilitate standardized information-sharing about the following types of information (detailed in the ERM and in further detail within this Section).</p> <p>Note: Some of this information may utilize initial 911 dispatch information as a “starting point”.</p> <ul style="list-style-type: none"> • Basic Incident information describing the incident associated with the Patient • Patient care provider (individual and organization) • Care provider transport (vehicle) used to transport the Patient • Patient unique identification and descriptive information • Tracking of Care Provider/Patient encounters and Patient physical movements • Tracking of Patient transition or transfer between different Care Providers and Care

	<p>Facilities</p> <ul style="list-style-type: none"> • Patient emergency evaluation, care, and disposition information at any point in time. • Patient closest relative(s) / guardian(s) emergency contact information
<p>2.</p>	<p>TEP (Routing Header) Distribution Types – TEP MUST support the ability for send and receive using the following message / distribution types:</p> <p>Report TEP Information – TEP MUST support the ability to <i>report</i> new / initial TEP information regarding a patient encounter.</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Report”.</p> <p>Update TEP Information – TEP MUST support the ability to send and receive <i>updated</i> TEP information at any time (incident, patient, encounter, care provider, transport, tracking of movement and transfers, and care information).</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Update”.</p> <p>Cancel TEP Information – TEP MUST support the ability to send and receive a cancelation of TEP information.</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Cancel”.</p> <p>Request TEP Information – TEP MUST support the ability to send and receive a <i>request</i> for TEP information.</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Request”.</p> <p>Respond to Request for TEP Information – TEP MUST support the ability to <i>respond</i> to a request for TEP information.</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType”.</p> <p>Acknowledge TEP Information – TEP MUST support the ability to <i>acknowledge</i> receipt of TEP information.</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Ack”.</p> <p>Reject TEP Information – TEP MUST support the ability to <i>reject</i> an earlier message (for technical reasons).</p> <p>Note: Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE distributionType “Error”.</p>
<p>3.</p>	<p>Message Sender – The TEP Standard MUST carry the actual sender of the TEP message / payload.</p> <p>EDXL-TEP will be routed by the EDXL-DE or equivalent; therefore the “Message Sender” requirement MUST be met using the DE or equivalent where applicable:</p> <p>EDXL-DE “senderID” (required)</p> <p>EDXL-DE “senderRole” (optional)</p> <p>Note: See also “systemID”</p>
<p>4.</p>	<p>TEP message dateTimeSent – TEP MUST support the date/time that the TEP message is actually sent.</p> <ul style="list-style-type: none"> • Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this

requirement is met by the EDXL-DE "dateTimeSent" element.

5. Attachments (Content Object) – TEP and / or its routing mechanism must be capable of carrying / attaching other related XML and non-XML content related to the TEP message patient such as:

- Photograph - Optional
- Fingerprints - Optional
- Existing patient electronic healthcare record - Optional
- Other XML content such as NEMESIS or HL-7 constructs. - Optional

Note 1 - Since TEP MUST be a payload of the EDXL-DE or equivalent routing mechanism, this requirement is met by the EDXL-DE "Content Object", wherein each DE may carry multiple content objects.

Note 2 - The TEP "**clientUniqueIdNumber**" must be used to uniquely identify the patient associated with each attachment or content object, and the "clientUniqueIdNumber" should be identical across Care Providers.

6. Routing multiple TEP messages - Each EDXL-Distribution Element or equivalent routing header MUST be capable of carrying from one to many TEP messages (as the EDXL-DE does today).

TEP is intended to be used as a single message structure to meet the requirements specified herein (in contrast to EDXL-Resource Messaging, which specifies multiple message structures). However, where the need or desire exists to route multiple independent TEP messages at the same time, this is facilitated using the routing mechanism such as the EDXL-Distribution Element (DE).

7. TEP "Message" Information Needs – The "TEP message" high-level entity is the top level element which contains information which uniquely identifies and describes a particular TEP message. The TEP Standard MUST contain the following elements of information:

- Message ID (**required**) - TEP MUST carry an identifier to uniquely differentiate each TEP message. The identifier must include an ID or number.
- System ID (optional) – TEP may optionally carry the identifier of the system or device which acts as the data source, or an individual's login credentials. This may include, for example, mobile hand-held devices used by practitioners in the field, and/or health monitoring equipment which may automatically feed vital signs for use in a TEP message.

8. Situation (Incident) Information Needs – In support of the business processes defined in Functional Requirement #2, the TEP Standard MUST carry information associated with or describing the incident related to the Care Provider and Patient Encounter. The purpose is to identify and describe the Situation / Incident which may have been associated with, played a role, or contributed to the Patient illness, injury, and medical condition.

The TEP Standard MUST contain the following Incident information. See the TEP Data Dictionary for definitions of each element.

- IncidentID / Type / Name "paired" data set (**required**), multiples allowed:
TEP MUST allow carrying of multiple sets of incident ID's, each with the associated type and optionally name, to facilitate the fact that multiple incident ID's are often created for the same incident across professions.
 - IncidentID (**required**)
 - incidentType (**required**)
 - incidentName (optional)

- incidentStartDateTime (optional)
- RelatedIncidentID (optional) – Identifier for a larger incident or disaster associated with the Care Provider / Patient Encounter incident.
- Incident Location (optional) - The location of the situation (incident), with the capability to express location information in a variety of forms including geopolitical (e.g. addresses), geospatial (e.g. lat/long) and as input to maps.

9. Care Provider Information Needs – In support of the business processes defined in Functional Requirement #2, the TEP Standards MUST carry information about the Care Provider responsible for servicing and providing care to the Patient during an Encounter for a particular period of time at a particular location. A “Care Provider” is defined as an EMS-certified individual who holds a State-Certified EMS license to practice or is licensed to practice medicine.

The TEP Standard MUST contain the following Care Provider information. See the TEP Data Dictionary for definitions of each element.

- personnelIdNumber (optional)
- personnelIdState (optional)
- personnelLevelOfCertification/License (optional)
- agency/HospitalNumber (**required**)
- agency/HospitalName (**required**)
- agency/HospitalState (**required**)
- providerType (**required**)
- agencyHospitalDomainName (optional)

10. Care Provider Transport Information Needs – In support of the business processes defined in Functional Requirements #2 and #3, TEP Standards MUST carry information about the Care Provider Transport (Vehicle - land, air and marine) used to transport the Patient over a particular period of time. In addition to providing valuable information, this may be used to facilitate physical tracking of the Patient through tracking of the actual transport vehicle.

The TEP Standard MUST contain the following Care Provider Transport information. See the TEP Data Dictionary for definitions of each element.

- unitNumber (**required** if transport information is send or received)
- vehicleType (optional)
- vehicleAgency (optional)
- vehicleState (optional)
- Current LOCATION (optional)

11. Patient Information Needs – In support of the business processes defined in Functional Requirement #2, the TEP Standard MUST carry information about and uniquely identifying the patient requiring evaluation and/or care from a certified Care Provider during an Encounter. A “Client” (patient) is defined as a victim requiring medical oversight or attention resulting from some type of incident, being medically evaluated; or a fatality (fatalities are treated as “Patients” in the scope of this effort).

TEP MUST uniquely identify a Patient regardless of Patient condition or available information in order to associate a record of condition and emergency care, and to facilitate physical tracking of Patient transport/movement, time of arrival prediction to receiving facilities, and to assist search and retrieval of an existing Patient “Electronic Health Record”. Patient information may also facilitate family notification by sharing information about the Patient

identification along with closest relative / guardian emergency contact information.

In context of a TEP message, client information can range from minimal information required to treat and track a Patient, to a full set of PII (Personally Identifiable Information) elements allowing unique identification of the person.

The TEP Standard MUST contain the following Patient information. See the TEP Data Dictionary for definitions of each element.

- clientUniqueIDNumber / Source “paired” data set (**required**), multiples allowed.
 - clientUniqueIDNumber
 - clientUniqueIDNumberSource
- a) One unique client ID number is desirable for use across all Care Providers in order to support desired objectives. However, during a mass casualty, one jurisdiction may assign a “unique” identifier, while another jurisdiction (perhaps receiving evacuated patients) may assign a different ID to the same patient. TEP MUST have the ability to carry multiple patient identifiers for each patient, each with the “source” or originator of that ID to assist personnel and receiving systems unique identification of each patient and their associated tracking information.
- b) The OASIS process SHALL recommend a standard format for this unique ID and specify as a default (not required) format. It is recommended that the format begin or be prefixed with a location or agency code identifying the location or agency source (who, what or where) that created the client(patient)’s unique identification number,
- gender (**required**) – added value for “unknown”. See data dictionary
- age (**required**) – may be estimated. See data dictionary.
- ageUnits (**required**)
- raceEthnicity (optional)
- dateOfBirth (optional)
- “personalIdentification “paired” data set, multiples allowed
 - personalIDType (optional)
 - personalIDNumber (optional)
- stateIssuingDriversLicense (optional)
- hairColor (optional)
- eyeColor (optional)
- distinguishingMarks (optional)
- primarySpokenLanguage (optional)
- medicationAllergies (optional) – multiples allowed
- currentMedications (optional) – multiples allowed
- specialTransportationNeeds (optional)
- specialMedicalNeeds (optional)
- specialCommunicationNeeds (optional)
- Security/SupervisionNeeds (optional)
- familyUnificationCode (optional)
- clientEvacuationStatus (optional)
- Patient contactInformation (optional)

- closestRelative/Guardian contactInformation (optional) – multiples allowed

12. Patient Encounter Information Needs – In support of the business processes defined in Functional Requirement #2, the TEP Standard MUST carry information about the initial encounter between each Care Provider and their Patient. An “encounter” is defined as the first or *initial* meeting or contact between a given Care Provider and a given Patient. The TEP Standard MUST contain the following Encounter information. See the TEP Data

Dictionary for definitions of each element.

- encounterID (**required**)
- encounterDateTime (**required**)
- LocationType (**required**)
- Current Location (**required**)

13. Patient Transfer Information Needs – In support of the business processes defined in Functional Requirement #2, the TEP Standard MUST carry information about a Patient Transfer if one occurs. “Transfer” is a set of information collected about Patient movement from one physical location or care facility to another, and/or between one Care Provider and another over the course of emergency treatment and transport. The TEP Standard MUST contains the following Transfer information. See the TEP Data Dictionary for definitions of each element.

- destinationTransferredToETA (optional)
- actualDepartureDateTime (optional)
- actualArrivalDateTime (optional)
- TransferredToDestination Location (optional)

NOTE: Client transfer - arrival at "transferredToDestination:

This requirement notes an actualArrivalDateTime. However, arrival (e.g. at the hospital) would trigger a new TEP message be created by the RECEIVING location / Care Provider, documenting a new Client Encounter. Therefore, the Client encounterDateTime may be used to designate the actualArrivalDateTime in certain use cases. The practitioner’s desire that a separate actualArrivalDateTime be included in the TEP Transfer section for cases where the “encounter” and “actual arrival” may be different. Otherwise, implementations may default the actualArrivalDateTime using the Client encounterDateTime

14. Patient Care Information Needs (i.e. “care record”) – In support of the business processes defined in Functional Requirement #2, the TEP Standard MUST carry information about Patient Care at every point in time that these observations, evaluations, electronic measures and actual treatments and procedures are taken or performed. A “Care record” is defined as a uniquely identified set of information observed or measured about a patient or performed on a patient at a point in time; such as triageStatus, clientCurrentDisposition, and various measurements and treatments.

Each “Care record” MUST be differentiated by a unique identifier, and a DateTime is required in order to identify when the “episode of care” takes place, and to associate the dateTime with the element values that were taken or performed. Certain elements require an associated DateTime in order for those elements to be accurately interpreted or to be valid.

The TEP Standard MUST contain the following minimum set of Care elements to facilitate TEP objectives. See the TEP Data Dictionary for definitions of each element.

- clientCareRecordID (**required**)
- clientCareRecordDateTime (**required**) – dateTime this entire Care record was taken. Acts as the unique ID for the Care record.

NOTE: This is to avoid capture of a dateTime for each and every instance of a care element.

- triageStatus (**required**)
- clientCurrentDisposition (**required**)
- contaminationRadiationContagionStatus (**required**) – Value of “unknown” added. See data dictionary.
- careProviderPrimaryImpression (optional)
- seriousConcerns (optional)
- chiefComplaint (optional)
- systolicBloodPressure (optional)
- diastolicBloodPressure (optional)
- pulseRate (optional)
- respiratoryRate (optional)
- cardiacMonitorRhythm (optional)
- 12LeadECGInterpretation (optional)
- pulseOximetry (optional)
- CO2Level (optional)
- bloodGlucoseLevel (optional)
- temperature (optional)
- totalGCS (optional)
- strokeScale (optional)
- thrombolyticScreen (optional)
- medicationsAdministered (optional)
- proceduresPerformed (optional)
- ACS/CDC Field Trauma Criteria (optional)

15. TEP message relationships: Incident, Care Provider and Patient – The TEP Standard design **MUST** enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

Each TEP message requires one and only one Incident, one and only one Care Provider, and one and only one Patient associated with that incident and being served by that Care Provider.

Note: See also Requirement 24 - “Relationship” Use Cases

16. TEP message relationships: Care Provider Transport – The TEP Standard design **MUST** enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

Each Care Provider **MUST** be associated with zero or one mode of transportation (vehicles - land, air and marine) used to transport this specific patient.

Note: See also Requirement 24 - “Relationship” Use Cases

17. TEP message relationships: Patient Encounter – The TEP Standard design **MUST** enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

One and only one Patient Encounter MUST exist for each patient and Care Provider. An “encounter” is defined as the first or *initial* meeting or contact between a given Care Provider and a given Patient.

Subsequent TEP messages sent by the same Care Provider about the same Patient MUST re-use the same Patient Encounter ID to share information about subsequent Patient Care or Transfers to facilitate end to end tracking objectives.

- See Requirement 24 below – additional interactions between a Care Provider and Patient within the same encounter are captured through the Patient “care record”; otherwise additional encounters require a new TEP message.
- Multiple independent messages may be sent against the same Care provider / Patient to report care. This does not require a new “encounter”.

Conversely, the same TEP message would never be sent by multiple Care Providers. One Care Provider MUST be associated with (responsible for) one Patient at any point in time.

Note: See also Requirement 24 - “Relationship” Use Cases

- 18.** TEP message relationships: Patient Encounter and Care record – The TEP Standard design MUST enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

Each Encounter between a Patient and Care Provider within one incident in one TEP message MUST contain from one to many patient “care records”. A “Care record” is defined as a set of information, observations, electronic measures and treatments collected about a Patient at a point in time, such as triageStatus, clientCurrentDisposition, proceduresPerformed and various vital signs. A Care Provider may attend to and take vitals of a Patient multiple times during creation of a given TEP message and/or within the same Encounter. Each instance may record or update measures or treatments.

This facilitates early preparation of “receiving Care Providers” along the chain of care and transport, as well as receiving facilities to prepare space, resources and treatments for the incoming Patient.

Note: See also Requirement 24 - “Relationship” Use Cases

- 19.** TEP message relationships: “New Message” Requirements – The TEP Standard design MUST enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

As stated in Information Needs Requirement #10, each TEP message may contain one or many Care records. But a new / different TEP message MUST be created whenever:

- Any new Patient Encounter occurs. Multiple independent messages may be sent against the same Care provider / Patient over time, which does not require a new “encounter”. An Encounter represents the *initial* contact between a Care Provider and a Patient
 - New care provider (e.g. patient transfer)
 - New Patient
- A new Patient is encountered, or an existing Patient is encountered by a new Care Provider. In this context, “new” implies new to the automated Patient Tracking process, and “existing” refers to a patient that is known to the Patient Tracking process (i.e. a TEP message has been sent).
- Multiple Care Providers are servicing the same patient at the same time. Each Care Provider Care associated with a different agency desiring to capture and share TEP data MUST create their own TEP message about the Patient. Procedurally it is desirable that TEP messages are being received by peer providers as the starting

point for updated information. The burden of receiving, associating, storing and displaying relevant information for each Patient is the burden of the receiving system.

- A different Situation (incident) applies

The current TEP message about that Patient has been sent

Note: See also Requirement 24 - "Relationship" Use Cases

- 20.** TEP message relationships: Patient Transfer – The TEP Standard design MUST enforce the following information relationships for each TEP message, as represented in the Element Reference Model (ERM):

TEP MUST capture multiple patient physical moves or changes in care provider in such a way that a single TEP message can carry information for multiple physical moves or Care Provider changes. One scenario or example is applied where no connectivity exists, or other circumstances which allow capture of multiple "transfers", but the TEP message is not sent until a later time.

Each Encounter between a patient and Care Provider within one incident in one TEP message MUST contain zero to one or many "Transfers". A "Transfer" is defined as a set of information collected about Patient movement from one physical location to another, and/or between one Care Provider and another. This means a given TEP message may contain no transfer data, may contain one transfer, or may contain multiple transfers that may have occurred before a TEP message was sent.

- No Transfer occurs when a Patient is immediately "released" by the initial Care Provider (i.e. released from care and allowed to leave). In this scenario a final patient disposition would be posted.

Note 2: See also Requirement 24 - "Relationship" Use Cases

- 21.** Supporting Elements: Contact Information – Supporting elements MUST be utilized and reused across TEP elements. TEP Standard Contact information MUST be utilized in a manner consistent with current OASIS EDXL Standards such as EDXL-RM, which uses Customer Information Quality (CIQ), or a specific and well-communicated plan and timeline developed to keep EDXL standards in synch for common concepts and elements (e.g. transition to VCARD).

TEP contact structures MUST be utilized to support the following elements:

- Patient ContactInformation
- closestRelative/Guardian ContactInformation
- TEP Message sender ContactInformation (senderID)

Supporting contact information SHALL include, but may not be limited to the following:

- LastName
- FirstName
- middleInitial
- telephoneNumber
- cellPhoneNumber
- emailAddress
- mailingAddress
- radioType
- radioChannel

- 22.** Supporting Elements: Location Information – Supporting elements MUST be utilized and reused across TEP elements. The TEP Standard MUST provide flexible options to specify

locations anywhere in the country or in the world. Location elements must be sufficient to support geopolitical and geospatial designations, and to support receiving system mapping applications and GPS tracking capabilities.

TEP Standard Location information MUST be utilized in a manner consistent with current OASIS EDXL Standards such as EDXL-RM, or a specific and well-communicated plan and timeline developed to keep EDXL standards in synch for common concepts and elements.

TEP contact structures MUST be utilized to support the following elements:

- StreetAddress
- City, State, Zip
- County
- Geospatial / Geographic coordinates
- legalDescription (Township, Section, Range)
- localName (Short Location or Area Description)
- GPSLocation
- Latitude / Longitude / Map locations
- US National Grid (USNG) Reference
- Etc.

- 23.** Supporting Elements: Value Lists – Supporting elements MUST be utilized and reused across TEP elements. Value Lists with values MUST be utilized consistently with existing OASIS EDXL Standards to provide a flexible approach to provision of managed lists of codes and other data selections.

- ValueListURN: xsd:AnyURI
- Value: xsdString [1..*]

This approach SHALL be used or considered with any element where a standardized managed list of options meets the stated requirement, such as:

- incidentType
- providerType
- vehicleType
- locationType
- ageUnits
- gender
- race
- eyeColor
- hairColor
- personalIdentificationType
- Patient Care Elements/Values
- Etc.

- 24.** “Relationship” Use Cases Supporting TEP Information requirements 15 through 20 – The following Use Cases provide illustration of the relationships defined in these requirements.

NOTE: In the Use Cases below, assume that each TEP message is sent FROM the current Patient Care Provider, TO other care providers servicing the incident, TO emergency

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management / command, and/or TO area emergency departments and hospitals.

445

446

USE CASE DESCRIPTION

TEP MESSAGES examples for patient

Use Case 1:	
1. Care Provider / ambulance encounters "Patient 1" at their home. Care Provider creates a TEP message / Encounter and Care record applying required elements and some minimum optional elements (vital signs, treatment); and sends the TEP message. (This TEP message contains one Care record).	Msg: 1 Care Provider: A Patient: 1 Encounter: abc Care Record: 1
2. Care Provider loads "Patient 1" into the ambulance and begins transport. Care Provider creates and sends another TEP message for "Patient 1", same encounter, updating Care record required elements, and completes Patient Transfer elements for ETA and actual departure (This TEP message contains one Care record).	Msg: 2 Care Provider: A Patient: 1 Encounter: abc Care Record: 1 (2 exist) Transfer Act. Departure: 0800 Transfer ETA: 15 min.
Use Case 2:	
1. Care Provider encounters multiple Patients during an auto accident. Care Provider creates an Encounter record and one Care record for each applying required elements and some minimum optional elements (vital signs, treatment), but does not yet send a TEP message. Note: The EDXL-DE can be used to route one message at a time or several TEP messages at once. (One care record captured but zero TEP messages sent)	Msg: 1 (not sent) Care Provider: A Patient: 2 Encounter: abc Care Record: 1
2. 20 minutes later the Care Provider updates some elements and adds others (again vital signs, treatment) for "Patient 2", and sends the TEP message. (This one TEP message contains two Care records).	Msg: 1 Care Provider: A Patient: 2 Encounter: abc Care Record: 2 (2 exist)
Use Case 3:	(continued from use case 2):
1. Following Use Case 2, step 2, 10 minutes later Care Provider attends "Patient 2", again, requiring a new TEP message updating previously recorded elements (another care record). The new TEP message is sent for the same Encounter for "Patient 2". Care Provider then physically "transfers" Patient to another Care Provider for transport. (This TEP message contains one Care record). (Total of 2 TEP messages and 3 care records thus far)	Msg: 2 Care Provider: A Patient: 2 Encounter: abc Care Record: 1 (3 exist)
2. Care Provider "B" creates new TEP message / Encounter for "Patient 2" recording and sending a TEP message with the ETA, actualDepartureDateTime and Location information, and updates one care record element (since it's required)	Msg: 1 (3 exist) Care Provider: B Patient: 2

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<p>(This TEP message contains one Care record) At the end of this full sequence, 3 TEP messages would have been sent about Patient 2. Receiving systems would now have 4 care records carried by these messages.</p>	<p>Encounter: xyz Care Record: 1 (4 exist) Transfer Act. Departure: 1300 Transfer ETA: 20 min.</p>
<p>Use Case 4:</p>	
<p>1. Care Provider "A" encounters multiple Patients during a mass casualty incident. Care Provider A creates an Encounter record and one Care record for each applying required elements and some minimum optional elements (vital signs, treatment), but does not yet send a TEP message.</p>	<p>Msg: 1 (not sent) Care Provider: A Patient: 4 Encounter: abc Care Record: 1</p>
<p>2. 20 minutes later Care Provider "A" updates some elements and adds others (again vital signs, treatment) for "Patient 2"; 10 minutes later does the same for "Patient 4" and another for "Patient 2", and sends both TEP messages. ("Patient2" TEP message contains three Care records). ("Patient4" TEP message contains two Care records).</p>	<p>Msg: 1 Care Provider: A Patient: 4 Encounter: xyz Care Record: 2 (2 exist)</p>
<p>3. "Patient 4" triageStatus = "Red". Care Provider "A" physically "transfers" Patient to another Care Provider "B" / ambulance for transport to a medevac landing site 15 minutes away, but creates no TEP message.</p>	<p>(same as above)</p>
<p>4. Care Provider "B" creates and sends new TEP message and Encounter for "Patient 4" recording and sending a TEP message with updated vitals but not providing Patient Transfer information (i.e. ETA, actualDepartureDateTime).. (This TEP message contains one Care record)</p>	<p>Msg: 1 (2 exist) Care Provider: B Patient: 4 Encounter: abc Care Record: 2 (2 exist)</p>
<p>5. Care Provider "B" physically "transfers" Patient to Care Provider "C" / medavac helicopter for transport to a Hospital Emergency Department. Care Provider "C" creates and sends new TEP message / Encounter for "Patient 4", updates one care record element (since it's required) and includes ETA, actualDepartureDateTime and Location information. (This TEP message contains one Care record) (Note that "B" didn't record the transfer from ambulance to medivac, so no information is captured or provided)</p>	<p>Msg: 1 (3 exist) Care Provider: C Patient: 4 Encounter: tuv Care Record: 1 (3 exist) Transfer Act. Departure: 1645 Transfer ETA: 30 min.</p>
<p>6. The destination facility prepares the medevac receiving site, emergency care facilities, and doctor or surgeon with the necessary skills based upon TEP messages with Care and Transport information.</p>	
<p>7. Upon landing, Care Provider "C" physically "transfers" Patient to Care Provider "D" / for stretcher to the Hospital Emergency Department. Patient #4 is taken from the landing pad into emergency care. Care Provider "D" creates and sends new TEP message / Encounter for</p>	<p>Msg: 1 (4 exist) Care Provider: D Patient: 4</p>

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<p>“Patient 4” with actualArrivalDateTime and Location. This TEP message (like others) is sent from the Emergency Department to the Hospital system to facilitate their preparation to take care of Patient #4.</p>	<p>Encounter: qrs Care Record: 1 (3 exist) Transfer Act. Arrival: 1720</p>
<p>8. During and following treatment, TEP message(s) are created. As “Patient 4” is transferred into the hospital ICU, the Emergency Department uses a TEP message to feed this information into the Hospital system, where all data from initial encounter at incident site is stored and stands available for additional Patient Care, Transfer or Release.</p>	<p>Msg: 1 (5 or more exist) Care Provider: E Patient: 4 Encounter: efg</p>

447 **3 EDXL-TEP Draft Messaging Specification**

448

449 **3.1 Introduction to EDXL-TEP Message Structure**

450 Though the final OASIS product will reflect technically implementable detailed modeling and definition, as
451 well as consistency and re-use across EDXL standards, this section provides a draft working model of the
452 message structure and definitions. It presents a high-level logical graphic and tabular representation of
453 the standard message requirements, information needs and definitions, attributes (such as cardinality)
454 and relationships.

455

456 This section **MUST** be considered in whole with the requirements and rest of the document within the
457 OASIS process, and is organized into the following major sections.

- 458 • TEP message distribution
- 459 • TEP "Required Elements" Model
- 460 • TEP Element Reference Model (ERM)
- 461 • TEP Common Elements Model
- 462 • Data Dictionary

463

464 **3.2 Distribution of EDXL-TEP**

465 The primary purpose of the Emergency Data Exchange Language TEP Messaging (EDXL- TEP)
466 Specification is to provide a standard format for XML-based Patient Tracking messages. These TEP
467 messages are specifically designed as "payloads" which carry information (content), which require a
468 separate standard routing mechanism.

469

470 **3.2.1 EDXL DISTRIBUTION ELEMENT (EDXL-DE)**

471 EDXL Distribution Element (EDXL-DE) V 1.0 was approved as an OASIS standard in April 2006. The
472 EDXL-DE provides a flexible message-distribution framework for data sharing among emergency
473 information systems using XML. The EDXL-DE may be used over any data transmission system,
474 including, but not limited to, the SOAP HTTP binding.

475

476 The primary purpose of the Distribution Element is to facilitate the routing of emergency messages to
477 recipients. The Distribution Element may be thought of as a "container". It provides the information to
478 route "payload" message sets (such as Alerts, Resource Messages or TEP messages), by including key
479 routing information such as distribution type, geography, incident, and sender/recipient IDs. Messages
480 may be distributed to specific recipients, to a geographic area, or based on codes such as agency type
481 (police, fire, etc.)

482

483 **3.2.2 EDXL-TEP Messaging Distribution**

484

485 The EDXL-DE is designed to carry one or more payloads called “Content Objects”. Each Content Object
486 may be well-formed XMLContent or NonXMLContent – objects such as pictures or documents. The
487 EDXL-TEP is designed to be well-formed XMLContent for routing using the EDXL-DE. The EDXL-DE
488 supports both context sensitive routing via metadata (i.e. information about the Content Objects) and
489 directed distribution (i.e. the sender specifies specific recipients).

490

491 While the EDXL-TEP is designed to be an EDXL-DE payload, other routing mechanisms may be used to
492 distribute EDXL-TEP content if the message metadata required for this standard is provided in the same
493 form.

494

495 **3.2.3 EDXL-SitRep Requirements addressed by the OASIS EDXL-** 496 **Distribution Element (DE) Standard**

497

498 The following requirements driven by the TEP practitioner definition process are met by using the EDXL-
499 DE or equivalent routing mechanism. Refer to the “Information Requirements” section.

500

501 **TEP Message Types (Distribution Types):**

502 Message types describe the function of the message. The following distribution types were identified as
503 requirements for use with TEP messages. No other “messages or message types” were identified.

- 504 h. Report - New information regarding an incident or activity.
- 505 i. Update - Updated information superseding a previous message.
- 506 j. Cancel - A cancellation or revocation of a previous message.
- 507 k. Request - A request for resources, information or action.
- 508 l. Response - A response to a previous request.
- 509 m. Ack - Acknowledgment of receipt of an earlier message.
- 510 n. Error - Rejection of an earlier message (for technical reasons).

511

512 **Element: “SentDateTime”**

513 Information Needs Requirement #4 – “TEP message dateTimeSent” is met by the **SentDateTime**
514 element within the EDXL-DE.

515

516 **Elements: “senderID” and “senderRole”**

517 Information Needs Requirement #3 – “Message Sender” is met by the **senderID** and “**senderRole**” -
518 elements within the EDXL-DE.

519

520 **Element: “ContentObject”**

521 Information Needs Requirement #5 – “Attachments” is met by the **ContentObject** element within the
522 EDXL-DE.

523

524 **Element: (n/a)**

525 Information Needs Requirement #6 - “Routing multiple TEP messages” ” is met by the multiple
526 **ContentObject** capability within the EDXL-DE.

527

528 3.3 STRUCTURE OF THE EDXL-TEP MESSAGE (NORMATIVE UNLESS 529 OTHERWISE STATED)

530 This section of the document is normative unless otherwise stated. If any differences are found between
531 the models and the data dictionary, then the data dictionary shall always take precedence and the other
532 artifact(s) must be changed to match the data dictionary.

533 This EDXL-TEP messaging standard and resulting schema provides an overall element reference
534 schema, used either in whole or applying constraint schemas during implementation. A constraint
535 schema is simply a subset of the standard reference schema which conforms to all the requirements and
536 business rules of the reference schema. For example, an implementation of the TEP standard may
537 eliminate selected optional elements, or enhance the definition of a required element.

538 The EDXL-TEP message structure and data dictionary is defined using successively more detailed or
539 constrained artifacts in the form of diagrams, figures and tables. The purpose of the diagrams is to
540 highlight the structure of the TEP framework and the relationships between the main blocks / entities and
541 their elements (represented as lines on the diagram). TEP models and data dictionary taxonomies reflect
542 practitioner terms, rules and requirements, and should reflect and agree with Section 2.5 “EDXL-TEP
543 Statement of Requirements (Normative)”.

544 The logical structure of the EDXL-TEP message is presented using 3 standard models. With the Data
545 Dictionary this provides an overall definition of the practitioner requirements in the form of message
546 structure (element cardinality), message element definitions and cardinality which must be adhered to.
547 “Cardinality” defines the number of possible occurrences of one element (a person may have many
548 “personallidentificationTypes” such as drivers license and passport), or how groups of elements link to
549 one another (each patient may have multiple care records).

550 ◆ EDXL-TEP Required Elements Model - TEP is first represented in a basic model which reflects
551 only the TEP **required** or **conditional** elements. This provides a snapshot of the minimum
552 elements required to send or receive a TEP message through entry or defaulting of known
553 information.

554 ◆ EDXL-TEP Element Reference Model (ERM) – Next TEP is represented in a full model which
555 represents a complete TEP message with all **required** and **optional** elements. This is the main
556 structure from which individual constraint schemas (individual TEP reports/message types) may
557 be defined and routed utilizing the EDXL-DE or equivalent routing mechanism.

558 ◆ EDXL-TEP Supporting Elements Model - Finally, elements which are used in common /
559 repeatedly in support of various sections of a TEP message are represented in the TEP
560 Supporting Elements model. Here and in the data dictionary, these elements are defined once
561 for re-use where needed, including Location, Contact and ValueList (code list) information.

562 Boxes on the diagram (“entities”) are used to define message structure by grouping related message
563 elements / tags and defining relationships between blocks of information (represented by lines on the
564 diagrams).

565 Textual descriptions of these TEP models may be found by referring to Section 2.5.3, “Information
566 Requirements”. Requirements #7 to #14 describe Information needs in terms of the data elements
567 required. Requirements #15 to #20 describe relationships of the various data within the message
568 structure (represented by lines between blocks). Finally, Requirements #21 to #23 describe information
569 needs in terms of the supporting data elements required.

570 A list of TEP Elements designating Required, Optional or Conditional is presented in section 4.0 followed
 571 by Section 4 - Data Dictionary providing definitions of each block and each element within these models.

572

573 The following key should be referenced in order to read each of these models.

574

Model KEY:

- Each block connected by lines denotes a block of information containing one or more elements which belong to / describe that block (e.g. as one or more attributes describe an Entity in an Entity Relationship Diagram (ERD)).
- A dashed-line block indicates required elements / capability, but not being defined within the scope of the diagram or this TEP standard
- The “diamond” end of a line is drawn from a block to the “sub-elements” that belong to or describe that block. The “diamond” end block is above in the hierarchy (the “parent”); thus the connected block is “associated with” or “belongs to” that higher level block.
- Lines between blocks (i.e. cardinality / number of occurrences of a group of elements) are read as follows:

————One and only one—————+
 ————Zero or one—————(0
 ————One or many—————<
- (c) following an element designates a “Conditional” element (vs. Required or Optional)
- On the full TEP Element Reference Model (ERM), **bold element names** are either **required** or Conditional. Non-bold elements are optional
 NOTE that the diagram in 3.3.1 shows required elements ONLY, and therefore are not bolded.
- Underlined elements indicate reference to supporting elements being reused
- An asterisk (*) next to an element designates the element may be used multiple times (i.e. element cardinality – multiple occurrences vs. only one)

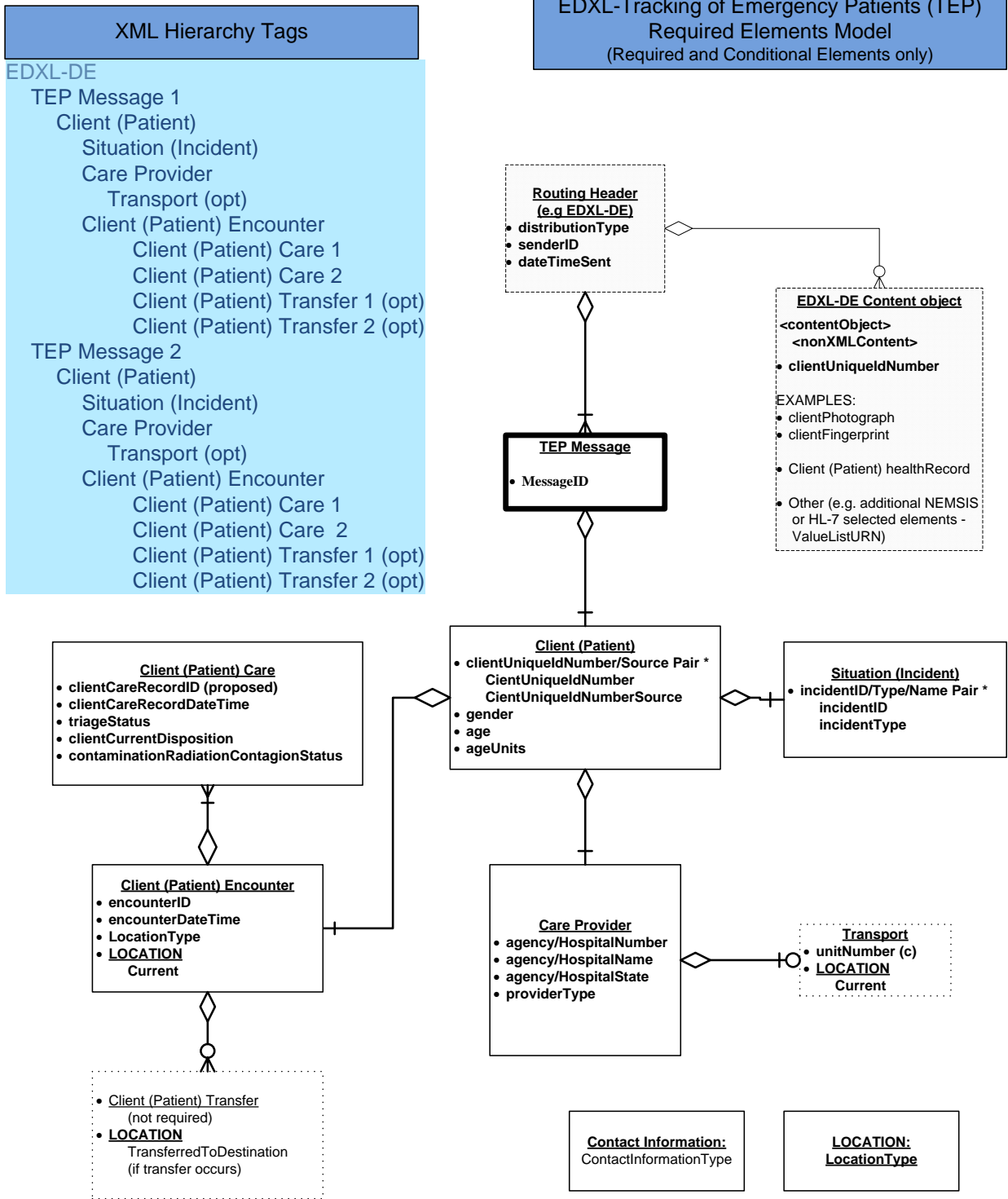
575

576 **3.3.1 Required Elements Model**

577 The following reflects the basic model showing ONLY the TEP **required** and **conditional** elements,
 578 providing a *snapshot of the minimum elements required for sending or receiving a TEP message*. It is
 579 important to note that careful consideration was given when determining the balance of minimum
 580 elements required for a valid and valuable TEP message, vs. the ability and burden of EMS in the field to
 581 capture this information; too many required elements could present a potential obstacle to TEP adoption.
 582 EMS field professionals felt that many of the elements may be defaulted with known values in
 583 implementation prior to use; thus further easing the field burden of data capture and sharing.

584

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585
586
587

Figure 1 – Required Elements Model

588

589 **3.3.2 EDXL-TEP Element Reference Model (ERM)**

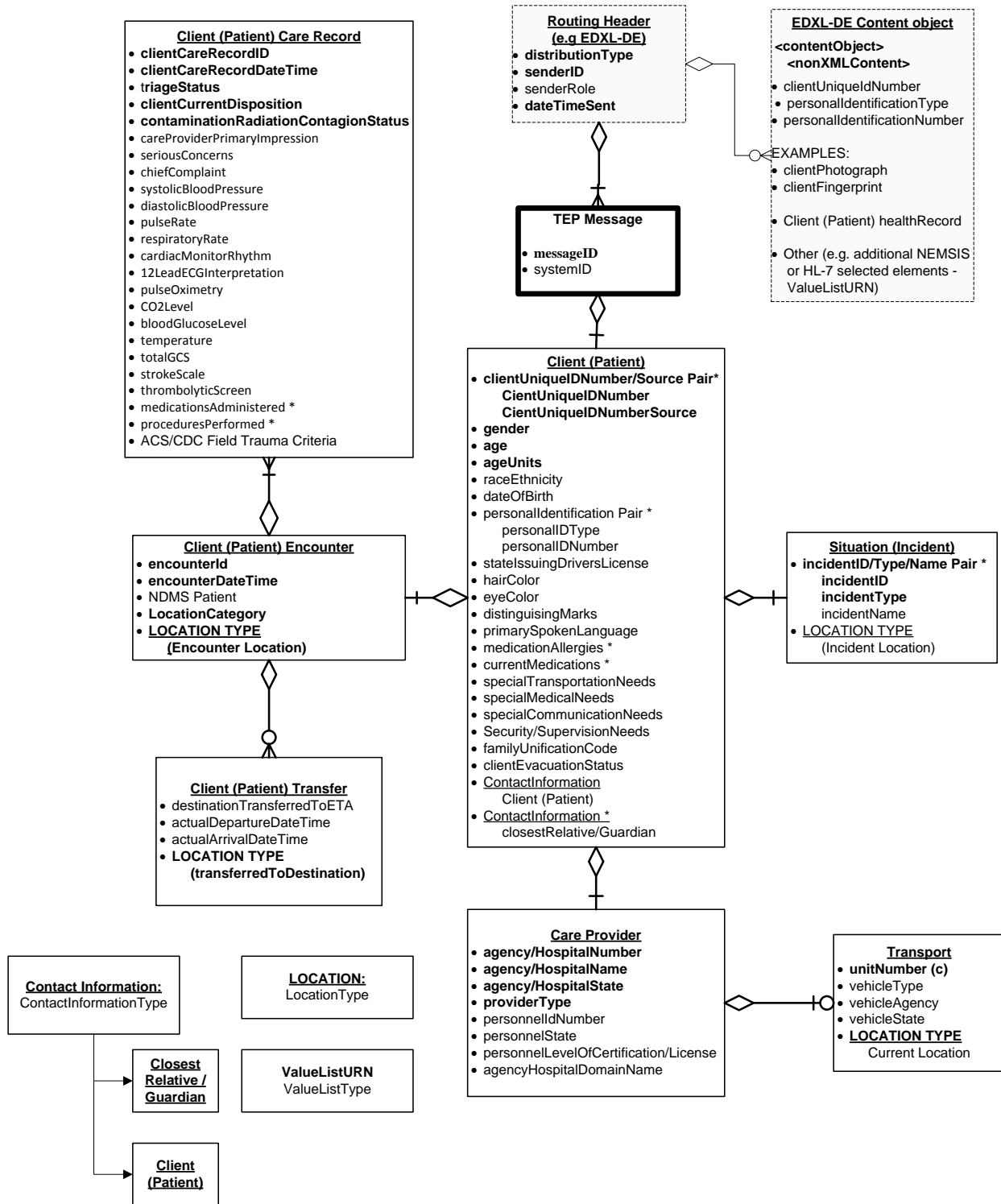
590

591 The ERM represents a detailed view of the logical structure of TEP Messages. The purpose of the ERM
592 is to highlight the more detailed structure of the TEP framework and the relationships between the main
593 entities and their elements. See the Abstract Reference Model section for a brief description of the main
594 elements. With the Data Dictionary this provides an overall definition of the practitioner requirements in
595 the form of message structure (element cardinality), message element definitions and cardinality which
596 must be adhered to. This model shows required elements in **bold**.

597

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EDXL-Tracking of Emergency Patients (TEP) Final Draft Element Reference Model (ERM)



598

599

Figure 2 – Element Reference Model (ERM)

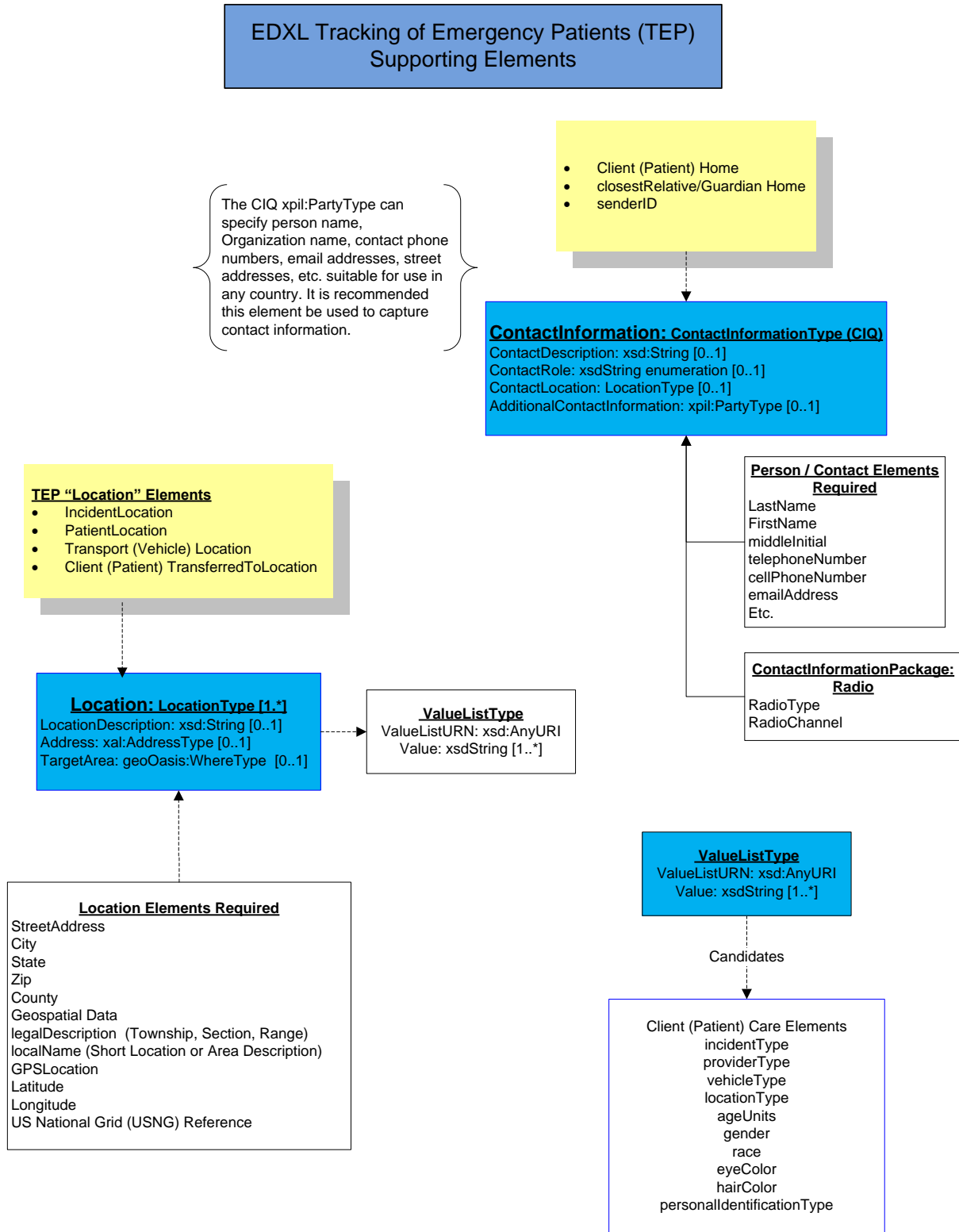
600

601 3.3.3 EDXL-TEP Supporting Elements Model

602 “Supporting Elements” are re-usable elements that apply to and support multiple areas of the TEP
603 messages, for example Locations, Contacts and Roles, and Unit of Measure. Reference to these re-
604 usable elements are noted in the main diagrams, with the details of each contained in the “Supporting
605 Elements” diagram. For example:

606

- 607 • **ContactInformation: ContactInformationType**
- 608 • **Location: Location Type**



609
610

Figure 3 – Supporting Elements Model

611 **4 Data Dictionary (Normative)**

612 **4.1 TEP Elements List and Optionality**

613

614 The following matrix provides a quick-reference to the TEP Elements designating Required, Optional or
 615 Conditional, with the condition stated. The data dictionary with detailed definitions then follows.

R = Required
 C = Conditional
 O = Optional

Tracking of Emergency Patients **OPTIONALITY**

Requirement / Block	Element Name	Optionality	Conditions / Comments
Routing Header	distributionType	R	
	senderID	R	
	senderRole	O	
	dateTimeSent	R	
Attachments	clientPhotograph	O	
	clientFingerprint	O	
	healthRecord	O	
	"Other" (e.g. HL-7 or NEMESIS structures)	O	
TEP Message	messageId	R	
	systemId	O	
Care Provider	agency/HospitalNumber	R	
	agency/HospitalName	R	
	agency/HospitalState	R	
	providerType	R	
	personnelIdNumber	O	
	personnelState	O	
	personnelLevelOfCertificationLicensure	O	
	agencyHospitalDomainName	O	
Transport	unitNumber	C	If "providerType" is EMS, then "unitNumber" is Required.
	vehicleType	O	
	vehicleAgency	O	
	vehicleState	O	
Location: Location	incidentLocation	R	

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Type	clientLocation	R	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
	gpsLocation	C	
	streetAddress	C	
	city	C	
	state	C	
	zip	C	
	county	C	
	geospatialData	C	
	latitude	C	
	longitude	C	
	usngReference	C	
	legalDescription	C	
	localName	O	
Patient Transfer	destinationTransferredtoEta	O	
	actualArrivalDateTime	O	
	actualDepartureDateTime	O	
Client(Patient) Encounter	encounterId	R	
	encounterDateTime	R	
	NDMS Patient	O	
	EncounterLocation	R	
	locationCategory	R	
Situation (Incident)	incidentName	O	
	incidentId	R	
	incidentType	R	
	incidentStartDateTime	O	
	relatedIncidentId	O	
Patient	clientUniqueIDNumber	R	
	clientUniqueIDNumberSource	R	
	gender	R	
	raceEthnicity	O	
	age	R	
	ageUnits	R	
	dateOfBirth	O	
	personalIDType	O	
	personalIDNumber	O	
	hairColor	O	
	eyeColor	O	

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	distinguishingMarks	O	
	primarySpokenLanguage	O	
	stateIssuingDriversLicense	O	
	specialTransportationNeeds	O	
	specialMedicalNeeds	O	
	medicationAllergies	O	
	currentMedications	O	
	securitySupervisionNeeds	O	
	familyUnificationCode	O	
	specialCommunicationNeeds	O	
	clientEvacuationStatus	O	
	clientContactInformation	O	
	closestRelativeGuardianContactInformation	O	
Contact Information	lastName	O	
	firstName	O	
	middleInitial	O	
	streetAddress	O	
	city	O	
	state	O	
	zip	O	
	county	O	
	country	O	
	telephoneNumber	O	
	cellPhone	O	
	emailAddress	O	
Patient Care	clientCareRecordID	R	
	clientCareRecordDateTime	R	
	chiefComplaint	O	
	systolicBloodPressure	O	
	diastolicBloodPressure	O	
	pulseRate	O	
	respiratoryRate	O	
	cardiacMonitorRhythm	O	
	12LeadEcgInterpretation	O	
	pulseOximetry	O	
	co2Level	O	
	bloodGlucoseLevel	O	

temperature	O	
totalGcs	O	
strokeScale	O	
thrombolyticScreen	O	
medicationsAdministered	O	
proceduresPerformed	O	
careProviderPrimaryImpression	O	
clientCurrentDisposition	R	
seriousConcerns	O	
contaminationRadiationContagionStatus	R	
acsCdcFieldTraumaCriteria	O	

Figure 4 – TEP Elements and Optionality

616
617

618

619 4.2 TEP Data Dictionary

620

621 The data dictionary is intended to provide detailed definition of each block of information (“entity”) and
622 each element represent in the TEP models in order to meet all TEP requirements. Though the data
623 dictionary is typically presented in standard OASIS format using one information table for each element,
624 this data dictionary is presented in the form of table rows for each element with columns providing
625 definition attributes.

626 This table format was also used to map required TEP elements to other relevant efforts for re-use
627 consideration (NEMSIS, AHRQ, and NIEM). Due to space, columns providing mapping to other effort
628 elements are not included in this document. However, the full mappings of TEP elements to these other
629 efforts may be referenced at <http://www.evotecinc.com/TEP/> (TEPdictionaryv18.xls). The table is
630 organized by entity / block of info as presented in the models, rather than alphabetically.

631

632 4.2.1 Data Dictionary Column Definitions

633

634 **TEP Message Entity** – A logical block of information used to group elements and allow definitions of
635 relationships.

636 **TEP Element** – Name of the information element.

637 **Type** – Type or format of the element.

638 **Usage** – Specifies whether the element is Required, Optional, or Conditional

639 If no optionality is specified, then the element is “Optional”.

640 If no Cardinality is specified, the element “MUST be used once and only once”

641 **TEP Definition** – Definition of the element as required for this messaging standard

642 **Valid Values/Examples** – A list of values that apply to this particular element, or examples which apply in
643 order to clarify the definition. Where valid values are specified for ValueListURN/Value type pairs, these
644 values are suggested as defaults, allowing implementations to use their own value list, or insert their own
645 value by extending the defaults.

646 **Comments** – Additional comments or examples to add clarity.

647 **Source** – Source of the requirement or usage of the element.

648 **Requirements Supported** – Number of the requirement supported by the element (*TO BE PROVIDED*
649 *IN A SUBSEQUENT VERSION*). Key:

650 G# - “General” requirement number.

651 F# - “Functional” requirement number.

652 I# - “Information” requirement number.

653

654 Where valid values are specified for ValueListURN/Value type pairs, these values are suggested as
655 defaults, allowing implementations to use their own value list, or insert their own value by extending the
656 defaults.

657

658

659 **4.2.2 Routing Header Elements**

660 Group of elements used for message routing.

661

Element	distributionType
Type	xs:string
Usage	REQUIRED
Definition	The function of the message . Value must be one of: a. Report - New information regarding an incident or activity. b. Update - Updated information superseding a previous message. c. Cancel - A cancellation or revocation of a previous message. d. Request - A request for resources, information or action. e. Response - A response to a previous request. f. Ack - Acknowledgment of receipt of an earlier message. g. Error - Rejection of an earlier message (for technical reasons).
Valid Values/Examples	Valid Values: Report, Update, Cancel, Request, Response, Ack, Error
Comments	1. Note that where an existing EDXL-DE element meets a stated practitioner requirement, that element will NOT be replicated, duplicated or referred to in the body of a TEP Message. The assumption and rule is that the EDXL-DE or equivalent will be used to route TEP messages, and therefore these requirements are met by the DE. 2. The EDXL-DE, "distributionType" element meets this requirement. Each of the values above will be treated as an enumeration in the EA tool. 3. Note: Suggestion to add "Test" as a value in the DE version discussions (however, note that the DE already contains "distributionStatus" of Actual, Exercise, System and Test. Need to confirm this will meet the need.
Source	EDXL-DE
Requirements Supported	Functional Requirement #'s 6,11; Information Requirement #2

662

Element	senderID
Type	xs:string

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Usage	REQUIRED
Definition	The unique identifier of the sender.
Valid Values/Examples	Example: dispatcher@example.gov, 0006.0e39.ad80@example.com
Comments	<ol style="list-style-type: none"> 1. Uniquely identifies human parties, systems, services, or devices that are all potential senders of the distribution message. 2. In the form actor@domain-name. 3. Uniqueness of the domain-name is guaranteed through use of the Internet Domain Name System, and uniqueness of the actor name enforced by the domain owner. 4. The identifier MUST be a properly formed -escaped if necessary- XML string.
Source	EDXL-DE
Requirements Supported	Functional Requirement # 6; Information Requirement #'s 3,21

663

Element	senderRole
Type	ValueListURN: xsd:AnyURI
Usage	OPTIONAL
Definition	The functional role of the sender, as it may determine message routing decisions or help to identify the message sender.
Valid Values/Examples	
Comments	<ol style="list-style-type: none"> 1. The list and associated value(s) is in the form: <senderRole> <valueListUrn>valueListUrn</valueListUrn> <value>value</value> </senderRole> where the content of <valueListUrn> is the Uniform Resource Name of a published list of values and definitions, and the content of <value> is a string (which may represent a number) denoting the value itself. 2. Multiple instances of the <value>, MAY occur with a single <valueListUrn> within

	<p>the <senderRole> container.</p> <p>3. Multiple instances of <senderRole> MAY occur within a single <EDXLDistribution> container.</p> <p>4. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list</p>
Source	EDXL-DE
Requirements Supported	Functional Requirement # 6; Information Requirement # 3

664

Element	dateTimeSent
Type	xsd:dateTime
Usage	REQUIRED
Definition	The system stamped date and time the TEP message was sent.
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	EDXL-DE
Requirements Supported	Functional Requirement # 6; Information Requirement # 4

665

666 **4.2.3 “Attachments” Elements**

667

668 Capability to carry "attachments" noted with a TEP message.(non-XML content or other non-TEP XML
 669 content)

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Element	clientPhotograph
Type	
Usage	OPTIONAL
Definition	Photograph of client(patient)
Valid Values/Examples	
Comments	May use the EDXL-DE ContentObject
Source	EDXL-TEP
Requirements Supported	Information Requirement # 5

670

Element	clientFingerprint
Type	
Usage	OPTIONAL
Definition	Fingerprint of client(patient)
Valid Values/Examples	
Comments	May be attached to the EDXL-DE
Source	EDXL-TEP
Requirements Supported	Information Requirement # 5

671

Element	Client (Patient) Health Record (or other)
----------------	---

Type	
Usage	OPTIONAL
Definition	An copy of the client(patient)'s electronic health record or other structured information elements (e.g. additional NEMESIS or HL-7 selected elements - ValueListURN)
Valid Values/Examples	
Comments	May be attached to the EDXL-DE. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-TEP
Requirements Supported	Information Requirement # 5

672

673

674 **4.2.4 TEP Message Elements**

675 Group of elements used to uniquely identify a TEP message and its source.

676

Element	messageID
Type	xs:string
Usage	REQUIRED
Definition	Each TEP message contains an identifier that uniquely identifies the message
Valid Values/Examples	
Comments	1. The TEP Element contains the "Distribution ID", which identifies the "container" for the distribution message information. 2. Same element as EDXL-RM, EDXL SitReps
Source	EDXL-SitRep, RM

Requirements Supported	
------------------------	--

677

Element	systemID
Type	xs:string
Usage	OPTIONAL
Definition	A unique system id, or login credentials of person entering TEP data, used to identify source of the information
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	

678

679 **4.2.5 Client (Patient) Elements**

680 Group of elements associated with the person that has been encountered and determined or suspected
 681 to be a patient. Used to uniquely identify and describe the person.

682

Element	clientUniqueIDNumber
Type	xs:string
Usage	REQUIRED, allow Multiple; always paired with clientUniqueIDNumberSource
Definition	A number or code issued to each client(patient) encountered; used as a unique identifier of the patient. Always paired with clientUniqueIDNumberSource
Valid Values/Examples	
Comments	This element is always paired with clientUniqueIDNumberSource whether one or

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	multiple instances of the pair are used. The clientUniqueIDNumber element may also be used in a ContentObject in the DE to uniquely identify attachments and other information such as a photograph.
Source	
Requirements Supported	Information Requirements #'s 5,11

683

Element	clientUniqueIDNumberSource
Type	xs:string
Usage	REQUIRED, allow Multiple; always paired with clientUniqueIDNumber
Definition	A notation identifying the source of the client (patient)'s unique identification number, to describe the source (who, what or where) that created the clientUniqueIDNumber.
Valid Values/Examples	"Source" Example: State of Maryland, JPTAS System, Hampshire County, WV, State of TN, NDMS etc.
Comments	This element is always paired with clientUniqueIDNumber whether one or multiple instances of the pair are used.
Source	
Requirements Supported	Information Requirements #'s 5,11

684

Element	gender
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED
Definition	The client(patient) gender

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Valid Values/Examples	Valid Values: Male, Female, Unknown
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

685

Element	raceEthnicity
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The client(patient) race/ethnicity as defined by the OMB (US Office of Management and Budget)
Valid Values/Examples	Example: White, African American, Asian, Hispanic/Latino
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	OMB Std for Classification of Federal Data on Race and Ethnicity
Requirements Supported	Information Requirement # 11

686

Element	age
Type	xs:integer
Usage	REQUIRED
Definition	The client(patient) age, either calculated from date of birth or best approximation is appropriate in situations where it is not possible to ascertain exact age.

Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

687

Element	ageUnits
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED
Definition	The units which the age is documented in.
Valid Values/Examples	Valid Values: Hours, Days, Months, Years
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

688

Element	dateOfBirth
Type	xs:date
Usage	OPTIONAL
Definition	The client(patient)s date of birth
Valid	

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Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

689

Element	personalIDType
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL, allow Multiple; always paired with personalIDNumber
Definition	Type or form of personal Identification.
Valid Values/Examples	Example: Drivers License, Social Security Card, Passport, Military ID, etc
Comments	This element is always paired with personalIDNumber whether one or multiple instances of the pair are used. TEP may carry multiple forms of identification. This element may also be used in a ContentObject in the DE to uniquely identify attachments and other information such as a photograph. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-TEP
Requirements Supported	Information Requirement #11

690

Element	personalIDNumber
Type	xs:string
Usage	OPTIONAL, allow Multiple; always paired with personalIDType (1 per)

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Definition	Unique number or alpha-numeric sequence contained on client(patient) Personal Identification.
Valid Values/Examples	
Comments	This element is always paired with personalIDType whether one or multiple instances of the pair are used. TEP may carry multiple ID numbers, one for each type of identification. This element may also be used in a ContentObject in the DE to uniquely identify attachments and other information such as a photograph.
Source	EDXL-TEP
Requirements Supported	Information Requirement # 11

691

Element	hairColor
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The client(patient) hair color
Valid Values/Examples	Example: Brown, Black, Blonde, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NIEM
Requirements Supported	Information Requirement # 11

692

Element	eyeColor
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]

Usage	OPTIONAL
Definition	The client(patient) eye color
Valid Values/Examples	Example: Blue, Brown, Green, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NIEM
Requirements Supported	Information Requirement # 11

693

Element	distinguishingMarks
Type	xs:string
Usage	OPTIONAL
Definition	Distinguishing marks on the client(patient)
Valid Values/Examples	
Comments	
Source	
Requirements Supported	Information Requirement # 11

694

Element	primarySpokenLanguage
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL

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Definition	A primary language spoken by the client(patient)
Valid Values/Examples	Example: English, Spanish, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	
Requirements Supported	Information Requirement # 11

695

Element	stateIssuingDriversLicense
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The state that issued the client(patient) driver's license
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	If personalIdentificationType is "Drivers License", then this element is REQUIRED Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

696

Element	specialTransportationNeeds
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL,

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Definition	A notation of client(patient) transportation needs based on client(patient) condition or other special needs, to assure safe transport.
Valid Values/Examples	Example: Advanced Life Support, Basic Life Support
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

697

Element	specialMedicalNeeds
Type	xs:string
Usage	OPTIONAL
Definition	A notation of special medical needs or advanced directives client(patient)s may have to assure that client(patient)s with these needs reach a location equipped to meet them
Valid Values/Examples	Example: ventilator, oxygen, dialysis, Do Not Resuscitate Order
Comments	
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

698

Element	medicationAllergies
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL, allow Multiple

Definition	The client(patient's) medication allergies
Valid Values/Examples	
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

699

Element	currentMedications
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL, allow Multiple
Definition	The medications the client(patient) currently takes
Valid Values/Examples	
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 11

700

Element	securitySupervisionNeeds
Type	xsd:boolean
Usage	OPTIONAL

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Definition	Indication that a Client(patient) may require special security for their own protection or that of others, such as prisoners, psychiatric patients, domestic abuse victims
Valid Values/Examples	Valid Values: True, False
Comments	“true” -Client requires special security “false” -Client does not require special security
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

701

Element	familyUnificationCode
Type	xs:string
Usage	OPTIONAL
Definition	A unique code that is assigned and tracked to individuals believed to be part of the same family unit, designed to link family members to each other
Valid Values/Examples	
Comments	
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

702

Element	specialCommunicationNeeds
Type	xs:string
Usage	OPTIONAL

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Definition	A notation of special communication needs to help arrange for translator services or services for hearing or vision impaired persons.
Valid Values/Examples	Example: Translator, Hearing Impaired, Vision Impaired
Comments	
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

703

Element	clientEvacuationStatus
Type	xs:string
Usage	OPTIONAL
Definition	A client(patient) status used in hospital, nursing home or other evacuations, to indicate current care requirement, to ensure transfer to an appropriate receiving facility with the same or similar care environment or capability
Valid Values/Examples	Valid Values: ICU, Floor, Discharge Ready
Comments	
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 11

704

Element	clientContactInformation
Type	Various
Usage	Optional

Definition	A patient's contact information.
Valid Values/Examples	
Comments	
Source	
Requirements Supported	Information Requirement # 11

705

Element	closestRelativeGuardianContactInformation
Type	Various
Usage	Optional
Definition	A patient's closest relative, guardian, emergency contact, or attendant's contact information.
Valid Values/Examples	
Comments	
Source	
Requirements Supported	Information Requirement # 11

706

707

708 **4.2.6 Situation (Incident) Elements**

709 Group of elements used to describe the incident associated with the patient.

710

Element	incidentName
Type	xs:string

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Usage	OPTIONAL, allow Multiple; always paired with incidentID and incidentType
Definition	The name assigned to the incident (often by the Incident Commander or Agency).
Valid Values/Examples	This element is always paired with incidentID and incidentType whether one or multiple instances of the pairing are used.
Comments	Different agencies or jurisdictions may use different names for the incident. TEP may carry one or more.
Source	EDXL-SitRep
Requirements Supported	Information Requirement #'s 1,8

711

Element	incidentID
Type	xs:string
Usage	REQUIRED, allow Multiple; always paired with incidentName and incidentType
Definition	The name, number or other identifier of the incident associated with the patient, to which the current TEP message refers, that has been assigned to the incident by an authorized agency based on current guidance, as the incident number may vary by jurisdiction and profession (e.g. law enforcement vs. Fire). The incident number may be a computer aided dispatch number, an accounting number, a disaster declaration number, or a combination of the state, unit/agency, and dispatch system number.
Valid Values/Examples	This element is always paired with incidentName and incidentType whether one or multiple instances of the pairing are used.
Comments	For the same incident, multiple incident ID's may be assigned. TEP may carry one or more.
Source	EDXL-SitRep
Requirements Supported	Information Requirement #'s 1,8

712

Element	incidentType
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED, allow Multiple; always paired with incidentName and incidentID
Definition	General definition, category or kind of the incident.
Valid Values/Examples	Example: CBRNE (Chemical, Biological, Nuclear, Explosives), Natural Disaster, Day to Day, etc. This element is always paired with incidentName and incidentID whether one or multiple instances of the pairing are used.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-SitRep
Requirements Supported	Information Requirement #'s 1,8; Functional Requirement #6

713

Element	incidentStartDateTime
Type	xsd:dateTime
Usage	OPTIONAL
Definition	The Date and Time the Incident started or was first observed.
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	EDXL-SitRep

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Requirements Supported	Information Requirement #'s 1,8
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714

Element	relatedIncidentId
Type	xs:string
Usage	OPTIONAL, allow Multiple
Definition	Identifier for a large scale incident (e.g. a Hurricane) which the current patient / Care Provider / Incident is associated with in some way.
Valid Values/Examples	
Comments	
Source	EDXL- TEP
Requirements Supported	Information Requirement #'s 1,8

715

Element	incidentLocation
Type	Various
Usage	REQUIRED
Definition	The physical location of the incident. Capability is required to express and capture location information in a variety of forms including geopolitical (e.g. addresses) and geospatial (e.g. lat/long).
Valid Values/Examples	
Comments	Uses Location: LocationType
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements	

Supported	
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716
717

718 **4.2.7 Care Provider Elements**

719

720 Group of elements used for identifying and describing a certified care provider (typically Emergency
721 Medical Services personnel)

Element	agencyHospitalNumber
Type	xs:string or ValueListURN: xsd:AnyURI
Usage	REQUIRED
Definition	The state assigned provider number of the responding agency or hospital
Valid Values/Examples	
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

722

Element	agencyHospitalName
Type	xs:string
Usage	REQUIRED
Definition	The formal name of the agency or hospital associated with the care provider
Valid Values/Examples	

Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

723

Element	agencyHospitalState
Type	ValueListURN: xsd:AnyURI
Usage	REQUIRED
Definition	The state in which the Agency or Hospital associated with the care provider provides services
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

724

Element	providerType
Type	ValueListURN: xsd:AnyURI
Usage	REQUIRED
Definition	The type of service provided by the care provider agency
Valid Values/Examples	Example: ED, EMS, Hospital, Intermediate Care Facility
Comments	Where possible, an existing vetted list should be offered as defaults, but allow

	users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

725

Element	personnelIDNumber
Type	xs:string
Usage	OPTIONAL
Definition	State or local Agency / Hospital ID number for the EMS-Care Provider
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

726

Element	personnelState
Type	ValueListURN: xsd:AnyURI
Usage	OPTIONAL
Definition	EMS-Care Provider's State of certification
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list

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Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

727

Element	personnelLevelOfCertificationLicensure
Type	ValueListURN: xsd:AnyURI
Usage	OPTIONAL
Definition	The medical certification level of the responding care provider
Valid Values/Examples	Example: EMT, Nurse, Doctor
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #9

728

Element	agencyHospitalDomainName
Type	xs:string
Usage	OPTIONAL
Definition	An agency or hospital identifier based on domain naming convention.
Valid Values/Examples	Example: fd.pittsburgh.pa.us
Comments	Next Generation 911 practitioners have indicated that a domain-type naming convention is in the process of being implemented for the purpose of identifying emergency responders

Source	NENA-Next Generation 911
Requirements Supported	Information Requirement #9

729

730 **4.2.8 Transport Elements**

731

732 Group of elements used for identifying and describing a conveyance (vehicle) used to transport a patient

733

Element	unitNumber
Type	xs:string
Usage	CONDITIONAL
Definition	The EMS/Responder vehicle unit number of the vehicle used for client(patient) conveyance
Valid Values/Examples	
Comments	CONDITIONAL (If "providerType" is EMS, then "unitNumber" is Required)
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #10

734

Element	vehicleType
Type	ValueListURN: xsd:AnyURI
Usage	OPTIONAL
Definition	Vehicle type of responding unit or vehicle of client(patient) conveyance
Valid Values/Examples	Examples: Ambulance, fire truck, bus, helicopter etc.

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Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #10

735

Element	vehicleAgency
Type	xs:string
Usage	OPTIONAL
Definition	Agency who owns the vehicle of client(patient) conveyance
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	Information Requirement #10

736

Element	vehicleState
Type	ValueListURN: xsd:AnyURI
Usage	OPTIONAL
Definition	The state in which the vehicle unitNumber is registered
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow

	users to extend values on that list, or to use their own value list
Source	EDXL-TEP
Requirements Supported	Information Requirement #10

737

Element	CurrentLocation
Type	Various - Uses Location: LocationType
Usage	OPTIONAL
Definition	The physical location of the transport vehicle, and therefore the client(patient) at any point in time. Capability is required to express and capture location information in a variety of forms, but primarily enabling GPS coordinate / map tracking of patient in-transit.
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	CurrentLocation

738

739

740 **4.2.9 Client (Patient) Encounter Elements**

741 Group of elements used to describe an instance of an encounter between a client (patient) and an EMS
 742 Care Provider.

743

Element	encounterID
Type	xs:string
Usage	REQUIRED

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Definition	A unique ID identifying an instance of the first or initial encounter between a client(patient) and an EMS Care Provider.
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	Information Requirement #12

744

Element	encounterDateTime
Type	xsd:dateTime
Usage	REQUIRED
Definition	Date and Time of client(patient)-EMS-Care Provider initial encounter
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	EDXL-TEP
Requirements Supported	Information Requirement #12

745

Element	NDMS Patient
Type	xsd:string or binary

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Usage	OPTIONAL
Definition	A flag (e.g. on/off checkbox), element or other designation designating an “NDMS patient”. ON identifies this patient as an NDMS patient. OFF does not designate this patient as an NDMS patient.
Valid Values/Examples	
Comments	
Source	NDMS live exercise Memphis, TN
Requirements Supported	NDMS Patient

746

Element	locationCategory
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED
Definition	The type of location where EMS-Care Providers encounter the client(patient)
Valid Values/Examples	Example: Emergency Department, Scene, Intermediate Care, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-TEP
Requirements Supported	Information Requirement #12

747

Element	EncounterLocation
Type	Various - Uses Location: LocationType

Usage	REQUIRED
Definition	The physical location of the instance of an encounter between a client (patient) and an EMS Care Provider. Capability is required to express and capture location information in a variety of forms including geopolitical (e.g. addresses) and geospatial (e.g. lat/long).
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	EncounterLocation

748

749

750 **4.2.10 Client (Patient) Care Elements**

751 Group of elements used to describe Care Provider observations, evaluations, electronic measures and
 752 actual treatments and procedures taken for or performed on the patient at a particular point in time.

753

754

Element	clientCareRecordID
Type	xs:string
Usage	REQUIRED
Definition	A unique ID identifying a patient's care record.
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	Information Requirement # 14

755

Element	clientCareRecordDateTime
Type	xsd:dateTime
Usage	REQUIRED
Definition	The date and time that any observations, evaluations, electronic measures and actual treatments and procedures were recorded. May also used to uniquely identify the care record, providing the date/time for that set of care attributes. For example, this is the dateTime associated with the chief complaint given, and each vital sign taken (heart rate, temperature, blood temperature etc.).
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	EDXL-TEP
Requirements Supported	Information Requirement # 14

756

Element	chiefComplaint
Type	xs:string
Usage	OPTIONAL
Definition	The statement of the problem verbalized by the client(patient) or the care provider in one or two words
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1

Requirements Supported	Information Requirement # 14
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757

Element	systolicBloodPressure
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) systolic blood pressure
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

758

Element	diastolicBloodPressure
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) diastolic blood pressure
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

759

Element	pulseRate
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) pulse rate, palpated or auscultated, expressed as a number per minute
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

760

Element	respiratoryRate
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) respiratory rate expressed as a number per minute
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
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761

Element	cardiacMonitorRhythm
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Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	Documentation of a client(patient)'s cardiac rhythm
Valid Values/Examples	Example: Ventricular Fibrillation, Normal Sinus Rhythm, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

762

Element	12LeadEcgInterpretation
Type	xs:string
Usage	OPTIONAL
Definition	The interpretation of the client (patient)s heart rhythm by the ECG device.
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

763

Element	pulseOximetry
Type	xs:integer

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Usage	OPTIONAL
Definition	The client(patient) oxygen saturation
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

764

Element	co2Level
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient)'s end-tidal or other CO2 level
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

765

Element	bloodGlucoseLevel
Type	xs:integer
Usage	OPTIONAL

Definition	The client(patient) blood glucose level
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

766

Element	temperature
Type	xs:decimal
Usage	OPTIONAL
Definition	The client(patient) body temperature in degrees Celsius/centigrade.
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

767

Element	totalGcs
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) total Glasgow Coma Score

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Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

768

Element	strokeScale
Type	xs:integer
Usage	OPTIONAL
Definition	The client(patient) Los Angeles or Cincinnati Stroke Scale Results
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

769

Element	thrombolyticScreen
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The results of the client(patient)Thrombolytic Screen for potential Thrombolytic use
Valid Values/Examples	Example: No Contraindications, Definite Contraindications, Possible Contraindications

Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

770

Element	medicationsAdministered
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL, allow Multiple
Definition	The medication given to the client(patient)
Valid Values/Examples	Example: Antibiotics, Insulin
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

771

Element	proceduresPerformed
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL, allow Multiple
Definition	The procedure performed on the client(patient).
Valid Values/Examples	Example: IV, CPR, Endotracheal Tube

Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

772

Element	careProviderPrimaryImpression
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The care provider personnel's impression of the client(patient)primary problem or most significant condition which led to the management given to the client(patient) (treatments, medications, or procedures).
Valid Values/Examples	Example: Cardiac Arrest, Stroke, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 14

773

Element	triageStatus
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED
Definition	Triage color for individuals assessed by medical personnel prior to being transported . Triage Status sets priorities for treatment
Valid Values/Examples	Valid Values: Red, Yellow, Green, Black

Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 14

774

Element	clientCurrentDisposition
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	REQUIRED
Definition	The state, status or outcome of a client(patient) at the end of emergency care (i.e. at the point of patient admission, transfer, release, death...)
Valid Values/Examples	Valid Values: Dead, No Treatment Required, Refused Care, Treated and Released, Treated and Transferred Care, Treated and Transported, Admitted, Treated and Transported to Hospital, Pending/Ongoing.
Comments	The default value for this element should be "Pending/Ongoing". Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-TEP
Requirements Supported	Information Requirement # 14

775

Element	seriousConcerns
Type	xs:string
Usage	OPTIONAL
Definition	Free form text field to communicate basic warning factors to Care Providers such as respiratory issues, tourniquet, fracture etc.

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Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	Information Requirement # 14

776

Element	contaminationRadiationContagionStatus
Type	xs:string
Usage	REQUIRED
Definition	A notation that an exposed client(patient) needs to be segregated, quarantined, or decontaminated, to avoid putting others at risk
Valid Values/Examples	Valid Values: True, False, Unkown
Comments	“true” -Patient may be contaminated/exposed. “false” -Patient has not been contaminated/exposed.
Source	AHRQ Natl Patient / Evacuee Track Sys
Requirements Supported	Information Requirement # 14

777

Element	acsCdcFieldTraumaCriteria
Type	xsd:boolean
Usage	OPTIONAL
Definition	A set of criteria pertaining to the decision by pre-hospital personnel to transport trauma victims, to a specialized acute care facility (trauma center), versus an undesignated, non-specialized acute care facility. The goal of the decision scheme is to match the clinical needs of an injured

	client(patient) to the resources and expertise of a given facility to care for them.
Valid Values/Examples	Valid Values: True, False
Comments	“true” -Transport to trauma center “false” -Transport according to protocol
Source	EDXL-TEP
Requirements Supported	Information Requirement # 14

778

779

780 **4.2.11 Client (Patient) Transfer Elements**

781 Group of elements used to describe and track physical movement or transport of a patient.

782

Element	destinationTransferredToEta
Type	xs:string
Usage	OPTIONAL
Definition	Estimated time of arrival at intended destination (to DestinationTransferredToID)
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	Information Requirement #13

783

Element	transferredToDestination
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Type	Various - Uses Location: LocationType
Usage	REQUIRED
Definition	The physical location that the patient is being transferred to. Capability is required to express and capture location information in a variety of forms including geopolitical (e.g. addresses) and geospatial (e.g. lat/long).
Valid Values/Examples	
Comments	
Source	EDXL-TEP
Requirements Supported	

784

Element	actualArrivalDateTime
Type	xsd:dateTime
Usage	OPTIONAL
Definition	The date/time the patient actually arrived at the destination.
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement #13

785

Element	actualDepartureDateTime
Type	xsd:dateTime
Usage	OPTIONAL
Definition	The date/time the patient departed from the current location
Valid Values/Examples	
Comments	(1) The date and time is represented in [dateTime] format (e. g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16: 49 PDT). (2) Alphabetic timezone designators such as "Z" MUST NOT be used. The timezone for UTC MUST be represented as "-00:00" or "+00:00.
Source	EDXL-TEP
Requirements Supported	Information Requirement #13

786

787

788 **4.2.12 Location: Location Type Elements**

789

790 Group of elements re-used where required describing a physical location. For TEP, this is used for
 791 patient physical tracking purposes and to specify Incident location.

792

Element	clientLocation
Type	Various
Usage	REQUIRED
Definition	The physical location of the client(patient). Capability is required to express and capture location information in a variety of forms including geopolitical (e.g. addresses) and geospatial (e.g. lat/long), and GPS coordinate / map tracking of patient in-transit

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Valid Values/Examples	
Comments	Uses Location: LocationType
Source	EDXL-TEP
Requirements Supported	

793

Element	gpsLocation
Type	xs:decimal
Usage	CONDITIONAL
Definition	The GPS coordinates used for identifying or describing location of things such as clients (patients) or incidents
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

794

Element	streetAddress
Type	xs:string
Usage	CONDITIONAL
Definition	The street address of the client(patient) current location or event location

Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

795

Element	city
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	CONDITIONAL
Definition	The city name of the client(patient) current location or event location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

796

Element	state
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	CONDITIONAL

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Definition	The State of the client(patient) current location or event location
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

797

Element	zip
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	CONDITIONAL
Definition	The zip code of the client(patient) current location or event location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

798

Element	county
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Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	CONDITIONAL
Definition	The County of the client(patient) current location or event location
Valid Values/Examples	Example: Arlington, Fairfax, Prince William
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application. Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	EDXL-SitRep ,NEMESIS v2.2.1
Requirements Supported	Information Requirement # 22

799

Element	geospatialData
Type	xs:decimal
Usage	CONDITIONAL
Definition	Other Geospatial data used for tracking patient location or identifying event location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep
Requirements Supported	Information Requirement # 22

800

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Element	latitude
Type	xs:decimal
Usage	CONDITIONAL
Definition	The latitude of the client(patient) current location or event location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep
Requirements Supported	Information Requirement # 22

801

Element	longitude
Type	xs:decimal
Usage	CONDITIONAL
Definition	The longitude of the client(patient) current location or event location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep
Requirements Supported	Information Requirement # 22

802

Element	usngReference
Type	xs:decimal
Usage	CONDITIONAL
Definition	The US National Grid Reference (USNG) is an alpha-numeric reference system that overlays the Universal Transverse Mercator (UTM) coordinate system. A USNG spatial address is broken down into three parts: Grid Zone Designation for a world-wide unique address, 100,000-meter Square Identification for regional areas, and Grid Coordinates for local areas.
Valid Values/Examples	Example: 18S UJ 23480647
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep
Requirements Supported	Information Requirement # 22

803

Element	legalDescription
Type	xs:string
Usage	CONDITIONAL
Definition	The official description of the client(patient) current physical location or incident location
Valid Values/Examples	Example: Township, Section, Range
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-SitRep

Requirements Supported	Information Requirement # 22
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804

Element	localName
Type	xs:string
Usage	OPTIONAL
Definition	Local or commonly known name of a location
Valid Values/Examples	
Comments	Where Location information is Required, one or more location elements fully describing that location are required, but only those required or available to the given application.
Source	EDXL-TEP
Requirements Supported	Information Requirement # 22

805

806 **4.2.13 Contact Information Elements**

807 Group of elements used to contact a person or persons. Used in TEP for 3 primary purposes: 1- Client
 808 (Patient) contact info, 2- Patient closestRelative/Guardian contact info, and 3- TEP message sender
 809 contact info.

810

Element	lastName
Type	xs:string
Usage	OPTIONAL
Definition	The last name of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid	

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Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

811

Element	firstName
Type	xs:string
Usage	OPTIONAL
Definition	The first name of the client(patient) , the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

812

Element	middleInitial
Type	xs:string
Usage	OPTIONAL
Definition	The middle initial of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	

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Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

813

Element	streetAddress
Type	xs:string
Usage	OPTIONAL
Definition	The street address of residence of the client(patient) , the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

814

Element	city
Type	xs:string
Usage	OPTIONAL
Definition	The city of residence of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	

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Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

815

Element	state
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The state of residence of the client (patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	Valid Values: AL, AK, AZ, etc.
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

816

Element	zip
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The zip code of residence of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list

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Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

817

Element	county
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The county of residence of the client(patient) , the client's closest relative or guardian, or TEP Message sender..
Valid Values/Examples	Example: Arlington, Fairfax, Prince William
Comments	Where possible, an existing vetted list should be offered as defaults, but allow users to extend values on that list, or to use their own value list
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

818

Element	country
Type	ValueListURN: xsd:AnyURI Value: xsd:String [1..*]
Usage	OPTIONAL
Definition	The country of residence of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	Example: United States, Mexico, Canada
Comments	
Source	NEMESIS v2.2.1

EDXL Tracking of Emergency Clients (TEC): Phase I - *Tracking of Emergency Patients (TEP)*
Requirements and Draft Messaging Specification 05/05/2010

Requirements Supported	Information Requirement # 21
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819

Element	telephoneNumber
Type	xs:string
Usage	OPTIONAL
Definition	The telephone number of the client(patient) , the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	
Source	NEMESIS v2.2.1
Requirements Supported	Information Requirement # 21

820

Element	cellPhone
Type	xs:string
Usage	OPTIONAL
Definition	The cell phone number of the client(patient) , the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	
Source	NIEM
Requirements Supported	Information Requirement # 21

821

Element	emailAddress
Type	xs:string
Usage	OPTIONAL
Definition	The email address of the client(patient), the client's closest relative or guardian, or TEP Message sender.
Valid Values/Examples	
Comments	
Source	NIEM
Requirements Supported	Information Requirement # 21

822

823 **5 APPENDICES**

824 The following appendices are provided to assist reading of the Specification. Please also refer to the
 825 appendices contained in the EDXL-TEP Project Initiation Document (PID) for additional information.

826 **5.1 APPENDIX A - EDXL-TEP Steering Committee Acknowledgements**

827 The following Emergency Professionals invested significant and valuable volunteer time, travel and effort
 828 as members of the TEP Steering Committee. This Steering Committee helped drive development of the
 829 PID and this draft Requirements and Messaging Specification document to facilitate vetting and
 830 consensus across a broad stakeholder community. Each member is gratefully acknowledged.

831

832 **TEP Project Working Group / Steering Committee Members**

LN	FN	Organization Represented
Mann	Clay, Dr.	NASEMSD, National EMS Information System (NEMSIS)
Mears	Greg, Dr.	UNC Chapel Hill EMS Medical Director
Donohue	John	Maryland Institute for EMS Systems (MIEMSS)
Sexton	Jeff	Tennessee DOH Office of Information Technology Services, HITSP
Moreland	Joe	Kansas Board of EMS
Whitney	Jolene	Bureau of EMS State of Utah
McGinnis	Kevin	Vice Chair-OIC PSG, National Association of State EMS Officials –NASEMSO, Joint National EMS Leadership Conference (JNEMSLC)

833

834 **EDXL-TEP Project Details**

Project Name	EDXL Tracking of Emergency Patients (EDXL-TEP)		
Sponsor/ DHS Lead	DHS-S&T-OIC, Denis Gusty denis.gusty@dhs.gov		
Practitioner Lead	Kevin McGinnis (see below)		
Project Staff Lead	Tim Grapes <i>Evolution Technologies, Inc.</i> Office: (703) 654-6075 Mobile: (703) 304-4829 tgrapes@evotecinc.com		
Project Work Group / Steering Committee Members	(SEE BELOW)		
Stakeholder Community	SEE APPENDIX A		
Start Date:	Research Phase: Q4, 2008 Project Start: January, 2009	Completion Date:	Target Standards Development Organization (SDO) submission Q1, 2010 ACTUAL: May, 2010

835 **5.2 APPENDIX B - Glossary / List of Acronyms**

836		
837	AHRQ	Agency for Healthcare Research and Quality
838	CAP	Common Alert Protocol
839	CDC	Centers for Disease Control
840	DE	Distribution Element
841	DHS	Department of Homeland Security
842	DOB	Date of Birth
843	DOD	Department of Defense
844	ED	Emergency Department
845	EDXL	Emergency Data Exchange Language
846	EIC	Emergency Interoperability Consortium
847	EMS	Emergency Medical Services
848	EM-TC	Emergency Management Technical Committee
849	ETA	Estimated Time of Arrival
850	HAVE	Hospital Availability Exchange
851	HIPAA	Health Insurance Portability and Accountability Act
852	HITSP	Healthcare Information Technology Standards Panel
853	HSPD-21	Homeland Security Presidential Directives
854	HTTP	Hypertext Transfer Protocol
855	IT	Information Technology
856	MCI	Mass Casualty Incident
857	NAEMSO	National Association of State EMS Officials
858	NEMIS	National EMS Information System
859	NIEM	National Information Exchange Model
860	NIMS	National Incident Management System
861	OASIS	Organization for the Advancement of Structured Information
862		Standards
863	OIC	Office for Interoperability and Compatibility
864	OPEN	Open Source Software
865	PID	Project Initiation Document
866	PMO	Project Management Office
867	PSG	Practitioner Steering Group
868	RM	Resource Messaging
869	SDO	Standards Development Organization
870	SitRep	Situation Reporting

871	SOAP	Simple Object Access Protocol
872	SOP	Standard Operating Procedure
873	SSN	Social Security Number
874	TEP	Tracking of Emergency Patients (standard)
875	SWG	Standards Working Group
876	UICDS	Unified Incident Command and Decision Support
877	XML	Extensible Markup Language
878		

879 **5.3 APPENDIX C - Definitions**

880
 881 The table provides definitions of just a few key terms for this effort.
 882

TERM	DEFINITION
<u>Client</u>	A person requiring medical oversight or attention, being medically evaluated, or a fatality. For the purposes of TEP, the term client may be used interchangeable with the term "Patient". In Phase II of the Tracking of Emergency Clients Project, the term client will be expanded to include a person displaced, evacuated, sheltering in place, expired, and/or requiring medical attention.
<u>Constraint Schema</u>	A constraint schema is simply a subset of the standard reference schema which conforms to all the requirements and business rules of the reference schema. For example, an implementation of the SitRep standard may eliminate selected optional elements, or enhance the definition of a required element.
<u>Cardinality</u>	"Cardinality" defines the number of possible occurrences of one element (a person may have many "personalIdentificationTypes" such as drivers license and passport), or how groups of elements link to one another (each patient may have multiple care records).
<u>Element</u>	"Tags" or "labels used as the placeholder for carrying commonly defined data element(s) / pieces of information with a common definition
<u>Entity</u>	Logical groupings of message elements or "blocks" of information describing the same "thing" for purposes of defining message structure and the relationships between those blocks of information. In the ERM diagram, boxes are entities; the relationships are represented by lines between the boxes.
<u>EMS incident continuum of care</u>	For the purposes of TEP the EMS incident continuum of care is initiated by the initial contact between a client and a Care Provider (see Care Provider definition) and concludes when a patient is released, admitted to a fixed medical facility, or transferred to the medical examiner/morgue.
<u>Emergency Responders</u>	Agencies and personnel with authoritatively recognized responsibility for responding to emergencies and disasters of any scale. Examples include: fire service, law enforcement, EMS, search and rescue, and public health.
<u>EMS-Care Provider</u>	An individual who holds an active state EMS certification and/or is licensed to practice to medicine, nursing, or another patient care discipline e.g. EMT, physician, nurse.
<u>Encounter or Patient Encounter</u>	The first or <i>initial</i> meeting or contact between a given Care Provider and a given Patient.
<u>Fixed Medical Facility</u>	For purposes of this standard and description of its scope and use, this describes a permanent facility that is not "intermediate" or "temporary" which offers definitive care for major illness/injury, or offers rehabilitative/custodial care. For purposes of this standard examples include Hospitals, Nursing Homes, and Rehabilitation Centers etc. as fixed "end point" facilities where patients are transported, beyond the realm of emergency care.

<u>Incident</u>	<p>For purposes of this messaging standard, “Situations”, “Incidents” and “Events” will be referred to generally as “incidents”. Situations in this context refer to occurrences of various scales - a collection of happenings, observations and actions that have been correlated on some basis that may require resources to perform Public Safety/Emergency/Disaster mitigation, planning and preparation, response or recovery.</p> <p>A Situation can be an incident, an event, or any observable or predictable occurrence. It is a generic term referring to occurrences of any scale that may require some form of emergency response and management, and that requires tracking and information exchange.</p> <p>“Incident” is viewed from the NIMS emergency management perspective as a formal or informal declaration of emergency or disaster by an organization at the state, local, federal level or by a jurisdiction. An incident may be assigned an official ID, name or other descriptive attributes. EDXL-TEP may refer to any situation whether an incident, event or other situation or occurrence.</p>
<u>Intermediate Care Facility</u>	<p>A facility that allows for the assessment and treatment of clients until they can either be released (minor illness/injury) or transported to a major/ institutional care facility (major illness/injury). Examples of intermediate care facilities are not limited to but include Triage Areas, Emergency Departments, and Field Hospitals.</p>
<u>Mass Casualty Incident</u>	<p>A situation in which EMS responders are overwhelmed by the number and/or severity of casualties at an incident and require resources beyond those available in their immediate jurisdiction. Typically invokes formal Incident Command Structure to define roles, responsibilities and authority across jurisdictional and professional boundaries.</p>
<u>Patient</u>	<p>A person requiring medical oversight or attention, being medically evaluated, or a fatality. For the purposes of TEP, the term patient may be used interchangeable with the term client.</p>

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884
885

886 5.4 APPENDIX D – Open Issues

887 A separate issues list (EDXL-TEP Stakeholder Comments) for the TEP project has been maintained since
888 development and distribution of the Project Initiation Document (PID). The list maintains all the issues
889 which have been closed as well as those outstanding (open) and currently “In-progress”.

890

891 To date, only 2 issues remain open in order to foster collaboration and cooperation across organizations
892 through re-use. The list is filtered to display all OPEN and IN-PROCESS issues. In-process issues or
893 comments have been addressed either or by explanation (see “Resolution” column) or within this EDXL-
894 TEP document version, “In-Progress” is used to convey disposition, answers to questions or responses
895 to comments prior to closure, whether or not the issue resulted in document changes.

896

897 The full issues list can be found on the following site:

898 <http://www.evotecinc.com/TEP/> (TEP-Stakeholder-IssuesRev10_02-24-2010.xls)

899