

# Standard Guide for Implementation of a Voluntary Universal Healthcare Identification System<sup>1</sup>

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## 1. Scope

1.1 This document describes the implementation principles needed to create a Voluntary Universal Healthcare Identification (VUHID) system. The purpose of this system is to enable unambiguous identification of individuals in order to facilitate the delivery of healthcare.

1.2 The VUHID system should be dedicated exclusively to the needs and functions of healthcare.

1.3 The VUHID system is designed to represent no, or at least minimal, increased risk to healthcare privacy and security.

1.4 The system should be as cost-effective as possible.

1.5 The system must be created and maintained in a way to provide sustained benefit to healthcare.

1.6 The system should be designed and implemented in a manner that ensures that it can operate indefinitely.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**E1714** Guide for Properties of a Universal Healthcare Identifier (UHID)

2.2 *Other Standard:*

**A11M Standard PDF417** Bar-coding

## 3. Terminology

3.1 *Acronyms:*

3.1.1 **2D**—two dimensional

3.1.2 **CDO**—care delivery organization

3.1.3 **EMPI**—enterprise master patient index

3.1.4 **MO**—managing organization

3.1.5 **OVID**—open voluntary healthcare identifier

3.1.6 **PVID**—private voluntary healthcare identifier

3.1.7 **VUHID**—voluntary universal healthcare identification

## 4. Summary of Guide

4.1 The VUHID facility described in this guide is responsible for issuing unique personal healthcare identifiers to any cooperating EMPI facility (defined below) upon receipt of an authenticated request. The issued identifiers must be consistent with Guide **E1714** and, as appropriate, would consist of both ‘open’ OVIDs (Open Voluntary Healthcare Identifiers) as well as PVIDs (Private Voluntary Healthcare Identifiers). This document will refer to any identifier issued by the VUHID, whether OVID or PVID, as a VUHID identifier. OVIDs are used to provide linkage of healthcare information for circumstances where the identity of the associated person is meant to be freely accessible. PVIDs (which exist in various privacy classes) permit linkage of various healthcare data items where the identity of the associated individual is *not* meant to be publicly available.

4.2 The VUHID system should be created as a secure high-availability server on the Internet which communicates exclusively with cooperating EMPI facilities using secure communication techniques. The VUHID facility issues identifiers and is responsible for maintaining policies and procedures relating to various classes of PVIDs. It does *not* store patient identification, demographic information, or clinical information and for this reason does not represent a security or privacy vulnerability. (See Section **12** for a description of how this approach is implemented when issuing a new identifier.) The VUHID facility should receive requests for information relating to a given identifier and distribute those requests to all cooperating EMPI facilities in order to fulfill the information sharing goals associated with unambiguous patient identification.

4.3 The identifiers issued by the VUHID facility can be used, consistent with the policy established for each identifier class, by all of the participating healthcare facilities interacting

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

with a cooperating EMPI to facilitate storage, linkage, and exchange within that system.

4.4 The VUHID facility should be controlled by a managing organization that is dedicated exclusively to the benefit of the healthcare industry.

## 5. Significance and Use

5.1 This standard describes a proposal to provide unambiguous personal identification for any patient who requests it. In today's world of specialized healthcare and mobile patients it is typical for clinical information on a single patient to reside in a variety of locations, some using manual data storage techniques, but an increasing number using electronic means. In order for a clinician to provide safe and appropriate clinical care in this environment it is necessary to be able to aggregate appropriate clinical information on a specific patient in order to gain an accurate and comprehensive picture of that patient's clinical situation. This implies that all information relating to each patient should be identified in a unique manner to facilitate the process of accurately aggregating appropriate information.

5.2 The converse of the need for data aggregation is the patient's need to protect the privacy of their information. Unless patients are confident that they can avoid inappropriate sharing of clinical information they will not readily share that information with caregivers. Thus, the same system that supports unambiguous linkage of all information concerning a patient must also play a role in protecting the privacy of that information.

5.3 The proposed patient identification system must be able to avoid or overcome the numerous objections that have prevented implementation of a universal patient identification system in the past including issues related to:

5.3.1 *Technology*—The proposed system must be technically feasible in a manner that promotes scalability, availability, and ease of implementation.

5.3.2 *Integration with Existing Systems*—To the maximum extent possible the proposed identification system should work seamlessly with existing information systems.

5.3.3 *Cost-effectiveness*—The proposed system should balance the costs and benefits required to implement a fully functional voluntary universal healthcare identification system.

5.3.4 *Political Feasibility*—Because many different constituencies have a vested interest in a universal patient identification system, it has been a significant challenge to gain consensus on how to implement such a system.

5.3.5 *Gradually Implementable*—In order to minimize the impact associated with its implementation, a desirable property of a voluntary universal healthcare identification system is that it be gradually implementable over time.

5.3.6 *Acceptable to the General Public*—A voluntary universal healthcare identification system must be accepted by the general public as a beneficial, effective and non-threatening capability.

5.4 Experience has shown that a healthcare identification system will only be feasible if it is dedicated exclusively to the needs of healthcare. It is only in this focused environment that it has been possible to create a consistent, feasible, functional, and effective design for such a system.

## 6. Anticipated VUHID Benefits

6.1 A universal healthcare identification system that is not used will offer no benefit. Since the VUHID is designed as a voluntary system, this is a significant risk if the system is not perceived by its potential users as offering sufficient value. Here is a partial list of the benefits that should accrue to people who choose to participate in the VUHID system.

6.2 *Increased Convenience*—Giving your VUHID card to a provider organization should eliminate the need to repeatedly provide a list of identifying demographic information. Instead, this information will be pulled automatically from the cooperating EMPI system.

6.3 *Improved Data Sharing*—Use of VUHID identifiers will enable clinical information to be more readily shared both within organizations and between organizations. In addition, the existence of private identifiers will enable more granular data sharing based on a variety of policy- and patient-specified principles.

6.3.1 *Locally*—The use of a VUHID should permit convenient and error-free linkage of information across all of the provider facilities operating within the domain of a cooperating EMPI facility.

6.3.2 *Nationally*—The use of VUHID should permit rapid, virtually error-free and comprehensive retrieval of any information stored within any cooperating EMPI that is participating in the VUHID network.

6.4 *Decreased Incidence of Medical Errors*—The use of VUHID identifiers permits comprehensive and virtually error-free linkage of medical records stored across a wide and heterogeneous mixture of healthcare provider facilities. Making this information available to a physician can greatly decrease the risk of inadvertent medical errors.

6.5 *Decreased Risk of Identity Theft*—Use of a VUHID identifier, particularly use of a PVID, means that an identifier, not the patient's identity, is at risk should the information be misused by a recipient or otherwise mishandled.

6.6 *Improved Control of Healthcare Information Privacy*—The ability to use various classes of PVIDs to link clinical information means that a person participating in the VUHID system has the ability to exercise precise control over various types of medical information.

6.7 *Improved Support for Clinical Trials*—Patients that participate in clinical trials can use a separate PVID to ensure that the clinical information needed for the trial is not linked to the remainder of their medical record.

## 7. Functions Supported by the VUHID System

7.1 Recruit cooperating EMPI facilities.

7.2 Validate each cooperating EMPI facility as a proper site to support VUHID activities and establish a contract with each cooperating EMPI site.<sup>3</sup>

7.3 Establish secure encrypted trusted communication with each cooperating EMPI facility.

7.4 Issue unique identifiers upon request from a validated cooperating EMPI facility and for each issued identifier log the time/date and the identity of the cooperating EMPI facility to which it is issued.

7.5 Respond to inquiries about an identifier's status including (1) whether it is valid based on examination of the check digits; (2) its status – not issued, active, retired; (3) when it was issued (and possibly the identity of the cooperating EMPI if usage policy permits this); and (4) if the identifier is unblinding, its current blinding status (not applicable, blinded, unblinded).

7.6 Define each new PVID class including the usage policies that apply to that class.

7.7 Establish the data items that need to be collected by the caregiver facility when requesting a VUHID identifier of any class (OVID or PVID), for example, the type of data, the type of facility, and the location of the facility.

7.8 Create a distributable electronic form to collect this information.

7.9 Provide upon request a description of the limitations and restrictions that apply to any particular class of private identifier.

7.10 Maintain the active/inactive status of each identifier.

7.11 Accept change of status indications from a cooperating EMPI for each identifier (active to retired/inactive, blinded to unblinded) and notify all cooperating EMPIs of these changes.

7.12 Issue the current status of a specific identifier on request.

7.13 Receive requests for clinical information from a cooperating EMPI relating to a specific identifier and distribute them to all cooperating EMPIs.

7.14 Log each clinical information request that is received and each identifier issued.

7.15 Issue code objects to print identifier cards for OVIDs and PVIDs.

7.16 Issue code objects to write OVIDs and PVIDs as 2D bar-codes.

7.17 Issue code objects to read OVIDs and PVIDs as 2D bar-codes.

7.18 Private identifiers that are intended to label blinded data may need to be unblinded. The VUHID will track the status of such identifiers to indicate if they are still blinded or have been unblinded.

## 8. Functions NOT Supported by the VUHID Facility

8.1 Storage of demographic, personal identifying, or clinical information associated with any identifier.

8.2 Providing the identity of an individual associated with any identifier.

8.2.1 A cooperating EMPI facility may support this function as long as it is consistent with the usage policy for that class of PVID or the identifier is an OVID.

8.2.2 An example of the need for this function is unblinding of research results at the end of a particular study. This would be supported by issuing a PVID class specifically designed to support this activity.

## 9. Identifier Principles

9.1 A VUHID identifier (both OVIDs and PVIDs) has the following syntax:

9.1.1 Prefix – 16 digits

9.1.2 Delimiter – a period “.”

9.1.3 Check digits – 8 digits

9.1.4 Privacy digits – 7 digits

9.1.5 Total identifier – 32 characters in length

9.2 An identifier represents an OVID if, and only if, all of the privacy digits are zero. If any privacy digit is non-zero then the identifier is a PVID. Here are two examples:

9.2.1 OVID: 1234567890123456.1234567800000000

9.2.2 PVID: 1234567890123456.926538261234567

9.3 Note that for purposes of brevity leading zeroes and trailing zeros that are privacy digits can be omitted so that 58206305.416389065892 is a valid identifier. (Trailing zeros that are check digits cannot be omitted.)

9.4 An identifier can be represented as a character string with a length of up to 32 digits and also as a 2D bar code using the AIIM Standard PDF417 bar code format.

9.5 Creation of other forms of representation of a VUHID, such as a magnetic stripe, is also permitted.

9.6 It should be feasible to enter a VUHID identifier using a telephone keypad. Either the ‘\*’ or ‘#’ keys may be used to represent the delimiter.

9.7 Each VUHID identifier must be considered to be an atomic item. It is not permitted to print, manipulate, represent, process, or otherwise handle just a portion of an identifier. Specifically, it is not valid to isolate the prefix portion and attach it by itself to a document or electronic file.

9.8 A VUHID identifier (both OVIDs and PVIDs) can only have one of two statuses: ‘active’ or ‘inactive’.<sup>4</sup> An identifier is marked as active when it is issued and it is marked as inactive when a valid request to do so is received by the VUHID facility from a cooperating EMPI facility. Any cooperating EMPI can request the current status of a specific identifier at any time as needed.

<sup>3</sup> For model contract language that might form a basis for the development of a VUHID contract, see [http://www.connectingforhealth.org/commonframework/model\\_contract.html](http://www.connectingforhealth.org/commonframework/model_contract.html).

<sup>4</sup> It is possible that a third category of ‘indeterminate’ may be needed, for example if the VUHID receives a status request about an identifier that has not yet been issued, or that is of a certain privacy class with restrictive privacy requirements.

9.9 Each time an automated system receives a VUHID identifier the system must examine the check digits to verify that it is a valid identifier. This verification must be performed prior to any storage or use of that identifier.

9.10 An identifier that fails validation will be deemed invalid and discarded. This can lead the receiving system to issue a request for reentry and/or resubmission of the identifier information.

9.11 The prefix portion of a VUHID identifier is unique only within its given privacy class. Each complete VUHID identifier is unique but the characters composing the prefix component are not unique across various privacy classes. Thus:

9.11.1 12345.1234567800000000, and

9.11.2 12345.1234567810000000 are two entirely independent identifiers that apply to two different persons. The first is an OVID and the second is a PVID of class 1000000. The fact that the prefix is identical in the two VUHID identifiers does not by itself have any significance. Specifically it does NOT mean that they apply to the same person.

9.12 Any leading prefix or trailing privacy class zeros or both in this string may be omitted for display purposes in order to make the identifier more compact but any zeros in the ‘interior’ of the identifier or zeros that occur in the check digits must be retained to preserve the integrity of the identifier. Thus both 0000057290683608.275094639350000 and 57290683608.27509463935 are valid representations of the same identifier.

9.13 To facilitate zero suppression of long PVIDs, new PVID classes will be defined and issued in a manner that makes possible as much zero suppression as possible for as long as is feasible.

9.14 For example, the first privacy class should be 1000000 rather than 0000001 and the second should be 2000000 rather than 0000002.

9.15 *Delimiter Requirements:*

9.15.1 The delimiter must be printable in all language type fonts.

9.15.2 It must be clearly distinguishable from all numeric digits.

9.15.3 Should be easily visible, “.” may be overlooked or not print well.

9.15.4 “;” or “:” or “\*” or “\$” or “@” or “#” are acceptable alternatives to “.”.

9.15.5 The space character is not a valid candidate to serve as the delimiter character.

## 10. Identifier Presentation

10.1 A VUHID identifier can be represented in one or more of three forms:

10.1.1 A character string that is human-readable. (Note that suppression of leading and trailing zeros as described in section 9.12 is permitted.)

10.1.2 A bar-code representation that is a faithful representation of the complete 32-character identifier string.

10.1.3 A magnetic stripe representation of the complete identifier character string.

10.2 Additional VUHID identifier representations such as smart cards may be permitted as determined by the VUHID managing organization.

## 11. Identifier Cards

11.1 Patients receiving a new VUHID identifier will be issued an ID card printed with both the character and bar code representations. For OVIDs the patient’s name may also be printed on the ID card. For PVIDs the patient’s name and any other identifying demographic information would NOT be printed on the card in order to preserve privacy should the card be lost.

11.2 OVID identification cards provided to a patient should be printed with a white paper background.

11.3 Printed versions of PVID identifier cards should be differentiated in some consistent manner, for example, using a colored card background, to make it clear that they represent private identifiers.

11.4 The word ‘private’ should be prominently displayed on each PVID card.

11.5 VUHID identifiers on printed documents:

11.5.1 An OVID may be printed on a document that also contains patient-identifying information such as name and demographics.

11.5.2 A PVID may NOT be printed with any associated patient name, patient demographics or any other patient-identifying information on the document.

11.6 For both OVIDs and PVIDs a bar code representation of the identifier may be accompanied, if desired, by a printed character representation of the identifier underneath the bar code as well.

11.7 Representation of OVIDs and PVIDs on laminated cards, credit-card formats, smart cards, magnetic stripes, and other media may be supported if approved by the VUHID managing organization.

## 12. Requesting an Identifier

12.1 A high-level diagram showing the sequence of events to request a new OVID identifier is shown in [Fig. 1](#).<sup>5</sup>

12.2 *Issuing a New OVID:*

12.2.1 The patient requests issuance of an ‘open’ identifier from their healthcare provider.

12.2.2 The healthcare provider’s staff collects the required demographic information to unambiguously identify the patient and sends this to the cooperating EMPI facility. The demographic information collected must be of sufficient scope and quality to ensure adequate confidence in the resulting EMPI match for the person.

12.2.3 The cooperating EMPI facility does a demographic match to identify the patient.

12.2.4 If the patient is not known to the EMPI it uses the demographic data to register the patient.

<sup>5</sup> The intent is that a new VUHID identifier can be rapidly (within a few minutes at most) issued whenever it is needed and in any care setting that is participating as part of a cooperating EMPI system.

# OVID Issuance

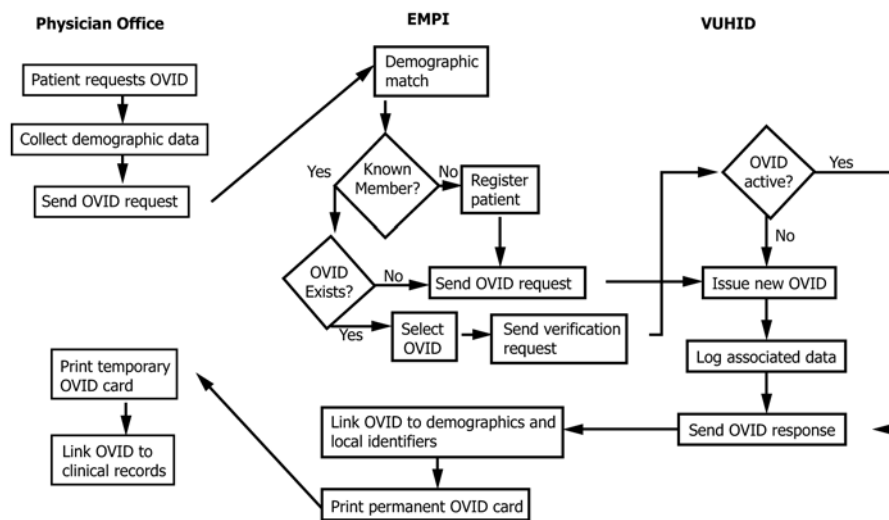


FIG. 1 OVID Issuance

12.2.5 If the patient is known to the EMPI facility it checks to see if the person already has an OVID. (The patient may have forgotten that they registered previously.)

12.2.6 If the cooperating EMPI determines that the patient does have an OVID, it queries the VUHID to determine that it is still active and, assuming that it is, the OVID is returned to the requesting healthcare provider. If the OVID identified by the EMPI is not active, the EMPI requests that the VUHID issue a new OVID for the patient to use.

12.2.7 If the EMPI determines the patient does not have an OVID identifier the demographic data is retained by the EMPI facility and a request for issuance of an OVID is sent to the VUHID.

12.2.8 The VUHID verifies the identity of the cooperating EMPI, issues a new unique OVID,<sup>6</sup> logs the time and the identity of the cooperating EMPI associated with this OVID and notes this OVID as being ‘active’.

12.2.9 The OVID is returned to the cooperating EMPI system.

12.2.10 The cooperating EMPI system links the OVID with the patient’s demographic information and with local identifiers associated with that patient, prints out a laminated card containing the patient’s name, OVID character string and the corresponding bar code to be mailed to the patient, and sends the OVID to the healthcare provider.

12.2.11 A temporary paper copy of the OVID is printed in the physician’s office and given to the patient along with brief instructions for its use.

12.2.12 The physician’s staff has the option to use the OVID to directly identify and link medical information associated

with that visit as well as any previously existing information associated with that patient.

## 12.3 Issuing a New PVID:

12.3.1 The patient requests issuance of an identifier from their healthcare provider’s office staff and indicates they wish this information to be kept confidential *or* the provider’s staff may know that the information to be covered is of a nature that requires confidentiality (for example, this is a psychiatric facility).

12.3.2 The physician’s staff obtains the patient’s OVID<sup>7</sup> or the required demographic information to identify the patient to the cooperating EMPI.

12.3.3 The staff also collects (using a form generated by the VUHID and downloaded from the cooperating EMPI facility) the additional information needed to describe the privacy aspects of this clinical episode—type of clinical information that will be processed, type of facility, location, etc.

12.3.4 The staff sends both (1) the OVID or demographic identifying information and (2) the privacy descriptive information to the cooperating EMPI.

12.3.5 The cooperating EMPI facility uses the OVID, if one is provided, to identify the patient or otherwise does a demographic match to identify the patient.

12.3.6 If the patient is not known to the EMPI, it uses the demographic data to register the patient.

12.3.7 If the patient is known to the EMPI, it checks to see if the person already has an active PVID (the patient may have forgotten that they previously obtained one) covering this

<sup>6</sup> Note that, for purposes of fraud detection, the prefixes of the OVIDs and PVIDs issued by the VUHID will not be issued in numeric order but will be issued in a random sequence. Thus, given one, or even a set, of prefixes, it is not possible to conclude what the prefixes of other valid VUHID identifiers might be.

<sup>7</sup> Note that it is a policy decision, yet to be determined, whether a person requesting a PVID should be required to have an OVID first. If this is determined to be the case, then a request to issue a PVID would automatically also result in the cooperating EMPI requesting the issuance of an OVID if the person does not yet have one.