

# De-identification Knowledge Base

## Overview

Updated: 30 June, 2015

Following industry best-practices, TCIA uses a standards-based approach to de-identification of DICOM images to insure that images are free of protected health information (PHI). The TCIA de-identification process ensures that the HIPAA de-identification standard is met by following the Safe Harbor Method as defined in section 164.514(b)(2) of the HIPAA Privacy Rule. The standard for de-identification of DICOM objects is defined by the DICOM Standard PS 3.15-2011 Digital Imaging and Communications in Medicine (DICOM), Part 15: Security and System Management Profiles ([ftp://medical.nema.org/medical/dicom/2016b/output/html/part15.html#chapter\\_E](ftp://medical.nema.org/medical/dicom/2016b/output/html/part15.html#chapter_E)). At the submitting site, a DICOM PS 3.15 compliant script removes or modifies DICOM tags deemed to be unsafe (See table 1 for a complete listing). TCIA incorporates the “Basic Application Confidentiality Profile” which is amended by inclusion of the following profile options: Clean Pixel Data Option, Clean Descriptors Option, Retain Longitudinal With Modified Dates Option, Retain Patient Characteristics Option, Retain Device Identity Option, and Retain Safe Private Option. The de-identification rules applied to each object are recorded by TCIA in the DICOM sequence Method Code Sequence [0012,0063] by entering the Code Value, Coding Scheme Designator, and Code Meaning for each profile and option that were applied to the DICOM object during de-identification. The DICOM standard for de-identification of objects defines a minimum set of elements to de-identify to be in compliance with the standard. It is up to the user doing the de-identification to insure that PHI is removed or cleaned according to the laws and practices in place at the time de-identification occurs.

## Details

### Base level de-identification

The Basic Application Confidentiality Profile requires that Patient Name and Patient ID are either blanked or modified. TCIA incorporates an ID mapping between the original Patient ID and the ID that the images will have within TCIA. The mapping table is created at the image submitting site, the mapping performed prior to the images leaving the sites host computer, and TCIA never sees the original Patient ID. The remapped Patient ID is also mapped to the Patient Name field. This is done for the case where a DICOM viewer or application being used by the TCIA user that downloaded the data would require a Patient Name to be present. To show that the Patient Identity has been removed, the term “YES” is written into DICOM tag 00120062 “PatientIdentityRemoved”.

In general, the Basic Application Profile specifies removal or modification of any tag that by definition would contain PHI that could be used either alone or together with other information to uniquely identify a subject. Removal of detailed geographic information, dates, exam identifiers, patient demographics, free text entry fields, vendor private tags, etc. are all done to minimize the possibility of being able to uniquely identify an individual. The options to the DICOM de-identification standard allows for retention of information to help make the data scientifically valuable, but as more options are added the chance of PHI is increased and a rigorous de-identification process must be followed.

**Exam Identifiers** - DICOM makes extensive use of universal identifiers (UID) that could be used to identify a subject if a user had access to the PACS system at the institution where the images originated. The Basic Application Confidentiality Profile requires that all UIDs be removed or modified. TCIA uses its own root UID, appends an 8 digit string in the form of xxxx.yyyy (where xxxx is related to the collection and yyyy is related to a submitting site) and then appends a hashed value of the original UID. UIDs have no special meaning other than serving as unique identifiers and the only reason TCIA adds the 8 digit string is to minimize the possibility of two images being assigned the same UID as images come from many different sites. This technique insures that images stay associated with the appropriate series, study, and subject as well as ensuring that referenced images between secondary capture images, structured reports, PET/CT, etc. are still valid references to images within TCIA. Any image resubmitted to TCIA will have the same UID to avoid the same image appearing twice with a different identifier. Original accession numbers are hashed with a 16 bit string to prevent linking of DICOM objects back to the submitting site.

**Dates** - The Retain Longitudinal With Modified Dates Option allows dates to be retained as long as they are modified

from the original date. Date and Date-Time fields in TCIA DICOM image headers have been offset based on a random number, but the longitudinal relationship between dates is maintained. Therefore, a researcher won't know the precise date the scan occurred, but if a follow up scan was performed 120 days later, that same 120 day difference between scans of a subject will exist in the TCIA images. Dates that occur in DICOM tags other than Date or Date-Time fields are removed. An example of this would be a date entered into the Series Description field. If the date is associated with a library for Code Meaning then that date is preserved as the date would be required to look up the meaning in the correct version of the library. To show that the dates have been modified, the term "MODIFIED" is written into DICOM tag 00280303 "LongitudinalTemporalInformationModified".

**Patient Demographics** – The keep Patient Characteristics Option allows keeping some patient demographics for research purposes. The allowed fields are Patient's Sex, Patient's Age, Patient's Size, Patient's Weight, Ethnic Group, Smoking Status, and Pregnancy Status. If a subject is over 90 years of age, then the age must be listed as 90+. Allergies, Patient State (this is not where they live, rather their condition), Pre-Medication, and Special Needs are defined by the DICOM standard as "clean" and are kept by TCIA and examined for PHI along with all tags during curation. Other patient demographics such as birthdate, address, religious affiliations, etc. are removed or emptied.

The names of health care providers including staff, hospital name, assigned IDs etc. are removed from the DICOM objects in cases where there is enough detail to identify an individual or facility where the scan was done.

**Free Text** - The Clean Descriptors Option allows for DICOM tags where free text could be entered by a technician to be kept. The following tags fall under that option and are all kept, inspected, and cleaned of PHI by TCIA during the curation process: Allergies, Patient State, Study Description, Series Description, Admitting Diagnoses Description, Admitting Diagnoses Code Sequence, Derivation Description, Identifying Comments, Medical Alerts, Occupation, Additional Patient's History, Patient Comments, Contrast Bolus Agent, Protocol Name, Acquisition Device Processing Description, Acquisition Comments, Acquisition Protocol Description, Contribution Description, Image Comments, Frame Comments, Reason for Study, Requested Procedure Description, Requested Contrast Agent, Study Comments, Discharge Diagnosis Description, Service Episode Description, Visit Comments, Scheduled Procedure Step Description, Performed Procedure Step Description, Comments on Performed Procedure Step, Requested Procedure Comments, Reason for Imaging Service Request, Imaging Service Request Comments, Interpretation Text, Interpretation Diagnosis Description, Impressions, and Results Comments. The TCIA de-identification script run at the submitting sites removes the field "Request Attributes Sequence" as that tag typically contains PHI and provides no scientific value. Many of these fields contain information valuable to research and are important to retain. For images that are submitted with missing Series Descriptions, TCIA will add text to Series Descriptions to help researchers during TCIA image searches. When a missing series description is encountered, TCIA staff will use the following approach: Enter "LOCALIZER" if the ImageType contains the word localizer; Enter "Contrast" and then append the value contained in Contrast Bolus Agent if a value is present; if Contrast Bolus Agent is missing or empty other tags will be examined to see if a series was scanned with contrast (The Image Comments field is often used by sites to denote contrast); if the Image is an MR then TCIA will map the Scanning Sequence parameters into the Series Description; if none of those conditions apply then TCIA will map Scan Options or simply enter "none" into the Series Description field.

**Devices** - The Retain Device Identity Option of the DICOM de-identification standard allows for the retention of information related to the scanner used. The option allows for the following relevant tags to be retained: Station Name, Device Serial Number, Device UID, Plate ID, Generator ID, Cassette ID, Gantry ID, Detector ID, Scheduled Study Location, Scheduled Study Location AE Title, Scheduled Station AE Title, Scheduled Station Name, Scheduled Procedure Step Location, Performed Station AE Title, Performed Station Name, Performed Station Name Code Sequence, Scheduled Station Name Code Sequence, Scheduled Station Geographic Location Code Sequence, and Performed Station Geographic Location Code Sequence. TCIA removes Station Name as part of its de-identification process as Station Name often contains information related to the site where the scan occurred. The other tags listed above are retained if they are found to be free of PHI after TCIA curation of the submitted DICOM objects.

**Private Tags** - When a submitting site sends DICOM data to TCIA all private tags are retained and then de-identified by TCIA during curation of the data according to the Retain Safe Private Option. The Retain Safe Private Option allows for the retention of DICOM tags stored in the private fields. These fields are extensively used by DICOM vendors to store information about the scans. To claim conformance to the DICOM standard the vendors must publish a DICOM conformance statement that defines the standard and private tags that are used by their particular equipment. These

conformance statements are typically made available on the vendors website for download. Unfortunately, there are cases where vendors do not make the conformance statement for a piece of equipment publicly available or do not adequately define what is stored in the private tags. In TCIA the Private DICOM elements are de-identified according to the rules contained in a de-identification knowledge base maintained by the TCIA team at the University of Arkansas for Medical Sciences. This knowledge base defines rules for de-identification of private tags based on a vendor's conformance statement for each scanner and software version. The manufacturer, manufacturer model, modality, and software version are extracted from each series submitted. The TCIA de-identification knowledge base is checked for a conformance statement matching these data. If not found, TCIA locates the conformance statement and adds it to the knowledge base. TCIA will remove any private tags from the images that are not specified in the conformance statement or are defined as containing a form of PHI such as name, SSN, etc. All date and datetime private tags that are retained are offset using the same offset as applied to the standard tags for the image. All private tags containing UIDs are assigned a TCIA root and appended with a hashed value as done with the standard tags. This ensures all references to other images contained within TCIA are maintained. A manual inspection of all private tags is performed using tagSniffer reports and any PHI that may be found is removed, emptied, date offset, or hashed as appropriate.

**Body Part Examined** - When images are made public, a single body part examined, corresponding to the cancer of interest, is assigned to all images. If the collection consists of sarcoma images (or any other cancer affecting multiple organs within the image collection), there may be multiple body parts assigned, though only one to any series. In phantom collections, body part examined is simply labeled "PHANTOM".

**All Tags** - The TCIA de-identification process ensures that every DICOM tag of every DICOM object is free of the 18 forms of PHI as currently defined by the Safe Harbor Method. At the submitting site, a DICOM PS 3.15 compliant script removes or modifies DIOCM tags deemed to be unsafe (See table 1 for a complete listing). At TCIA, a software routine known as tagSniffer extracts every unique value found within a collection being curated and prints them to a report. This report is examined by curators and any actions necessary to remove PHI is applied when moving the images from the Intake server to the Public Server. Every DICOM image is inspected by curators for burned in PHI. Once the images reach the Public Server, the tags are inspected by two curators for PHI using new tagSniffer reports. Images are spot checked for any burned in PHI.

The following table details the de-identification performed at the submitting site by way of a TCIA supplied de-identification script.

**Table 1**

| Tag      | Name                                   | Action        |
|----------|--|---------------|
| 00080050 | AccessionNumber                        | hash          |
| 00184000 | AcquisitionComments                    | keep          |
| 00400555 | AcquisitionContextSeq                  | remove        |
| 00080022 | AcquisitionDate                        | incrementdate |
| 0008002a | AcquisitionDatetime                    | incrementdate |
| 00181400 | AcquisitionDeviceProcessingDescription | keep          |
| 00189424 | AcquisitionProtocolDescription         | keep          |
| 00080032 | AcquisitionTime                        | keep          |
| 00404035 | ActualHumanPerformersSequence          | remove        |
| 001021b0 | AdditionalPatientHistory               | keep          |

|          |                                 |               |
|----------|---------------------------------|---------------|
| 00380010 | AdmissionID                     | remove        |
| 00380020 | AdmittingDate                   | incrementdate |
| 00081084 | AdmittingDiagnosesCodeSeq       | keep          |
| 00081080 | AdmittingDiagnosesDescription   | keep          |
| 00380021 | AdmittingTime                   | keep          |
| 00102110 | Allergies                       | keep          |
| 40000010 | Arbitrary                       | remove        |
| 0040a078 | AuthorObserverSequence          | remove        |
| 00130010 | BlockOwner                      | CTP           |
| 00180015 | BodyPartExamined                | BODYPART      |
| 00101081 | BranchOfService                 | remove        |
| 00280301 | BurnedInAnnotation              | keep          |
| 00181007 | CassetteID                      | keep          |
| 00400280 | CommentsOnPPS                   | keep          |
| 00209161 | ConcatenationUID                | hashuid       |
| 00403001 | ConfidentialityPatientData      | remove        |
| 00700086 | ContentCreatorsIdCodeSeq        | remove        |
| 00700084 | ContentCreatorsName             | empty         |
| 00080023 | ContentDate                     | incrementdate |
| 0040a730 | ContentSeq                      | remove        |
| 00080033 | ContentTime                     | keep          |
| 0008010d | ContextGroupExtensionCreatorUID | hashuid       |
| 00180010 | ContrastBolusAgent              | keep          |
| 0018a003 | ContributionDescription         | keep          |
| 00102150 | CountryOfResidence              | remove        |
| 00089123 | CreatorVersionUID               | hashuid       |
| 00380300 | CurrentPatientLocation          | remove        |
| 00080025 | CurveDate                       | incrementdate |
| Group    | curves                          | remove        |

|          |                                    |  |
|----------|------------------------------------|--|
| 00080035 | CurveTime                          | keep   |
| 0040a07c | CustodialOrganizationSeq           | remove   |
| ffffcffe | DataSetTrailingPadding             | remove   |
| 00181200 | DateofLastCalibration              | incrementdate                                    |
| 0018700c | DateofLastDetectorCalibration      | incrementdate                                    |
| 00181012 | DateOfSecondaryCapture             | incrementdate                                    |
| 00120063 | DeIdentificationMethod             | {Per DICOM PS 3.15 AnnexE. Details in 0012,0064} |
| 00120064 | DeIdentificationMethodCodeSequence | 113100/113101/113105/113107/113108/113109/113111 |
| 00082111 | DerivationDescription              | keep   |
| 0018700a | DetectorID                         | keep   |
| 00181000 | DeviceSerialNumber                 | keep   |
| 00181002 | DeviceUID                          | keep   |
| ffffaffa | DigitalSignaturesSeq               | remove   |
| 04000100 | DigitalSignatureUID                | remove   |
| 00209164 | DimensionOrganizationUID           | hashuid  |
| 00380040 | DischargeDiagnosisDescription      | keep   |
| 4008011a | DistributionAddress                | remove   |
| 40080119 | DistributionName                   | remove   |
| 300a0013 | DoseReferenceUID                   | hashuid  |
| 00102160 | EthnicGroup                        | keep   |
| 00080058 | FailedSOPInstanceUIDList           | hashuid  |
| 0070031a | FiducialUID                        | hashuid  |
| 00402017 | FillerOrderNumber                  | empty  |
| 00209158 | FrameComments                      | keep   |
| 00200052 | FrameOfReferenceUID                | hashuid  |
| 00181008 | GantryID                           | keep   |
| 00181005 | GeneratorID                        | keep   |
| 00700001 | GraphicAnnotationSequence          | remove   |

|          |                                       |               |
|----------|---------------------------------------|---------------|
| 00404037 | HumanPerformersName                   | remove        |
| 00404036 | HumanPerformersOrganization           | remove        |
| 00880200 | IconImageSequence                     | remove        |
| 00084000 | IdentifyingComments                   | keep          |
| 00204000 | ImageComments                         | keep          |
| 00284000 | ImagePresentationComments             | remove        |
| 00402400 | ImagingServiceRequestComments         | keep          |
| 40080300 | Impressions                           | keep          |
| 00080012 | InstanceCreationDate                  | incrementdate |
| 00080014 | InstanceCreatorUID                    | hashuid       |
| 00080081 | InstitutionAddress                    | remove        |
| 00081040 | InstitutionalDepartmentName           | remove        |
| 00080082 | InstitutionCodeSequence               | remove        |
| 00080080 | InstitutionName                       | remove        |
| 00101050 | InsurancePlanIdentification           | remove        |
| 00401011 | IntendedRecipientsOfResultsIDSequence | remove        |
| 40080111 | InterpretationApproverSequence        | remove        |
| 4008010c | InterpretationAuthor                  | remove        |
| 40080115 | InterpretationDiagnosisDescription    | keep          |
| 40080202 | InterpretationIdIssuer                | remove        |
| 40080102 | InterpretationRecorder                | remove        |
| 4008010b | InterpretationText                    | keep          |
| 4008010a | InterpretationTranscriber             | remove        |
| 00083010 | IrradiationEventUID                   | hashuid       |
| 00380011 | IssuerOfAdmissionID                   | remove        |
| 00100021 | IssuerOfPatientID                     | remove        |
| 00380061 | IssuerOfServiceEpisodeId              | remove        |
| 00281214 | LargePaletteColorLUTUid               | hashuid       |

|          |   |               |
|----------|---|---------------|
| 001021d0 | LastMenstrualDate                       | incrementdate |
| 00280303 | LongitudinalTemporalInformationModified | MODIFIED      |
| 04000404 | MAC                                     | remove        |
| 00080070 | Manufacturer                            | keep          |
| 00081090 | ManufacturerModelName                   | keep          |
| 00102000 | MedicalAlerts                           | keep          |
| 00101090 | MedicalRecordLocator                    | remove        |
| 00101080 | MilitaryRank                            | remove        |
| 04000550 | ModifiedAttributesSequence              | remove        |
| 00203406 | ModifiedImageDescription                | remove        |
| 00203401 | ModifyingDeviceID                       | remove        |
| 00203404 | ModifyingDeviceManufacturer             | remove        |
| 00081060 | NameOfPhysicianReadingStudy             | remove        |
| 00401010 | NamesOfIntendedRecipientsOfResults      | remove        |
| 00102180 | Occupation                              | keep          |
| 00081070 | OperatorName                            | remove        |
| 00081072 | OperatorsIdentificationSeq              | remove        |
| 00402010 | OrderCallbackPhoneNumber                | remove        |
| 00402008 | OrderEnteredBy                          | remove        |
| 00402009 | OrderEntererLocation                    | remove        |
| 04000561 | OriginalAttributesSequence              | remove        |
| 00101000 | OtherPatientIDs                         | remove        |
| 00101002 | OtherPatientIDsSeq                      | remove        |
| 00101001 | OtherPatientNames                       | remove        |
| 00080024 | OverlayDate                             | incrementdate |
| Group    | overlays                                | remove        |
| 00080034 | OverlayTime                             | keep          |
| 00281199 | PaletteColorLUTUID                      | hashuid       |



|          |                                       |           |
|----------|---------------------------------------|-----------|
| 0040a07a | ParticipantSequence                   | remove    |
| 00101040 | PatientAddress                        | remove    |
| 00101010 | PatientAge                            | keep      |
| 00100030 | PatientBirthDate                      | empty     |
| 00101005 | PatientBirthName                      | remove    |
| 00100032 | PatientBirthTime                      | remove    |
| 00104000 | PatientComments                       | keep      |
| 00100020 | PatientID                             | Re-Mapped |
| 00120062 | PatientIdentityRemoved                | YES       |
| 00380400 | PatientInstitutionResidence           | remove    |
| 00100050 | PatientInsurancePlanCodeSeq           | remove    |
| 00101060 | PatientMotherBirthName                | remove    |
| 00100010 | PatientName                           | Re-Mapped |
| 00102154 | PatientPhoneNumbers                   | remove    |
| 00100101 | PatientPrimaryLanguageCodeSeq         | remove    |
| 00100102 | PatientPrimaryLanguageModifierCodeSeq | remove    |
| 001021f0 | PatientReligiousPreference            | remove    |
| 00100040 | PatientSex                            | keep      |
| 00102203 | PatientSexNeutered                    | keep      |
| 00101020 | PatientSize                           | keep      |
| 00380500 | PatientState                          | keep      |
| 00401004 | PatientTransportArrangements          | remove    |
| 00101030 | PatientWeight                         | keep      |
| 00400243 | PerformedLocation                     | remove    |
| 00400241 | PerformedStationAET                   | keep      |
| 00404030 | PerformedStationGeoLocCodeSeq         | keep      |
| 00400242 | PerformedStationName                  | keep      |
| 00404028 | PerformedStationNameCodeSeq           | keep      |

|          |  |               |
|----------|--|---------------|
| 00081052 | PerformingPhysicianIdSeq                 | remove        |
| 00081050 | PerformingPhysicianName                  | remove        |
| 00400250 | PerformProcedureStepEndDate              | incrementdate |
| 00401102 | PersonAddress                            | remove        |
| 00401101 | PersonIdCodeSequence                     | remove        |
| 0040a123 | PersonName                               | empty         |
| 00401103 | PersonTelephoneNumbers                   | remove        |
| 40080114 | PhysicianApprovingInterpretation         | remove        |
| 00081048 | PhysicianOfRecord                        | remove        |
| 00081049 | PhysicianOfRecordIdSeq                   | remove        |
| 00081062 | PhysicianReadingStudyIdSeq               | remove        |
| 00402016 | PlaceOrderNumberOfImagingServiceReq      | empty         |
| 00181004 | PlateID                                  | keep          |
| 00400254 | PPSDescription                           | keep          |
| 00400253 | PPSID                                    | remove        |
| 00400244 | PPSStartDate                             | incrementdate |
| 00400245 | PPSStartTime                             | keep          |
| 001021c0 | PregnancyStatus                          | keep          |
| 00400012 | PreMedication                            | keep          |
| Group    | privategroups                            | keep          |
| 00131010 | ProjectName                              | always        |
| 00181030 | ProtocolName                             | keep          |
| 00540016 | Radiopharmaceutical Information Sequence | process       |
| 00181078 | Radiopharmaceutical Start DateTime       | incrementdate |
| 00181079 | Radiopharmaceutical Stop DateTime        | incrementdate |
| 00402001 | ReasonForImagingServiceRequest           | keep          |
| 00321030 | ReasonforStudy                           | keep          |
| 04000402 | RefDigitalSignatureSeq                   | remove        |

|          |  |         |
|----------|--|---------|
| 30060024 | ReferencedFrameOfReferenceUID          | hashuid |
| 00380004 | ReferencedPatientAliasSeq              | remove  |
| 00080092 | ReferringPhysicianAddress              | remove  |
| 00080090 | ReferringPhysicianName                 | empty   |
| 00080094 | ReferringPhysicianPhoneNumbers         | remove  |
| 00080096 | ReferringPhysiciansIDSeq               | remove  |
| 00404023 | RefGenPurposeSchedProcStepTrans<br>UID | hashuid |
| 00081140 | RefImageSeq                            | remove  |
| 00081120 | RefPatientSeq                          | remove  |
| 00081111 | RefPPSSeq                              | remove  |
| 00081150 | RefSOPClassUID                         | keep    |
| 04000403 | RefSOPInstanceMACSeq                   | remove  |
| 00081155 | RefSOPInstanceUID                      | hashuid |
| 00081110 | RefStudySeq                            | remove  |
| 00102152 | RegionOfResidence                      | remove  |
| 300600c2 | RelatedFrameOfReferenceUID             | hashuid |
| 00400275 | RequestAttributesSeq                   | remove  |
| 00321070 | RequestedContrastAgent                 | keep    |
| 00401400 | RequestedProcedureComments             | keep    |
| 00321060 | RequestedProcedureDescription          | keep    |
| 00401001 | RequestedProcedureID                   | remove  |
| 00401005 | RequestedProcedureLocation             | remove  |
| 00321032 | RequestingPhysician                    | remove  |
| 00321033 | RequestingService                      | remove  |
| 00102299 | ResponsibleOrganization                | remove  |
| 00102297 | ResponsiblePerson                      | remove  |
| 40084000 | ResultComments                         | keep    |
| 40080118 | ResultsDistributionListSeq             | remove  |

|          |                                      |               |
|----------|--------------------------------------|---------------|
| 40080042 | ResultsDIssuer                       | remove        |
| 300e0008 | ReviewerName                         | remove        |
| 00404034 | ScheduledHumanPerformersSeq          | remove        |
| 0038001e | ScheduledPatientInstitutionResidence | remove        |
| 0040000b | ScheduledPerformingPhysicianIDSeq    | remove        |
| 00400006 | ScheduledPerformingPhysicianName     | remove        |
| 00400001 | ScheduledStationAET                  | keep          |
| 00404027 | ScheduledStationGeographicLocCodeSeq | keep          |
| 00400010 | ScheduledStationName                 | keep          |
| 00404025 | ScheduledStationNameCodeSeq          | keep          |
| 00321020 | ScheduledStudyLocation               | keep          |
| 00321021 | ScheduledStudyLocationAET            | keep          |
| 00321000 | ScheduledStudyStartDate              | incrementdate |
| 00080021 | SeriesDate                           | incrementdate |
| 0008103e | SeriesDescription                    | keep          |
| 0020000e | SeriesInstanceUID                    | hashuid       |
| 00080031 | SeriesTime                           | keep          |
| 00380062 | ServiceEpisodeDescription            | keep          |
| 00380060 | ServiceEpisodeID                     | remove        |
| 00131013 | SiteID                               | SITEID        |
| 00131012 | SiteName                             | SITENAME      |
| 001021a0 | SmokingStatus                        | keep          |
| 00181020 | SoftwareVersion                      | keep          |
| 00080018 | SOPInstanceUID                       | hashuid       |
| 00082112 | SourceImageSeq                       | remove        |
| 00380050 | SpecialNeeds                         | keep          |
| 00400007 | SPSDescription                       | keep          |

|          |  |               |
|----------|--|---------------|
| 00400004 | SPSEndDate                             | incrementdate |
| 00400005 | SPSEndTime                             | keep          |
| 00400011 | SPSLocation                            | keep          |
| 00400002 | SPSStartDate                           | incrementdate |
| 00400003 | SPSStartTime                           | keep          |
| 00081010 | StationName                            | remove        |
| 00880140 | StorageMediaFilesetUID                 | hashuid       |
| 30060008 | StructureSetDate                       | incrementdate |
| 00321040 | StudyArrivalDate                       | incrementdate |
| 00324000 | StudyComments                          | keep          |
| 00321050 | StudyCompletionDate                    | incrementdate |
| 00080020 | StudyDate                              | incrementdate |
| 00081030 | StudyDescription                       | keep          |
| 00200010 | StudyID                                | empty         |
| 00320012 | StudyIDIssuer                          | remove        |
| 0020000d | StudyInstanceUID                       | hashuid       |
| 00080030 | StudyTime                              | keep          |
| 00200200 | SynchronizationFrameOfReference<br>UID | hashuid       |
| 0040db0d | TemplateExtensionCreatorUID            | hashuid       |
| 0040db0c | TemplateExtensionOrganizationUID       | hashuid       |
| 40004000 | TextComments                           | remove        |
| 20300020 | TextString                             | remove        |
| 00080201 | TimezoneOffsetFromUTC                  | remove        |
| 00880910 | TopicAuthor                            | remove        |
| 00880912 | TopicKeyWords                          | remove        |
| 00880906 | TopicSubject                           | remove        |
| 00880904 | TopicTitle                             | remove        |
| 00081195 | TransactionUID                         | hashuid       |

|          |  |             |
|----------|--|-------------|
| 00131011 | TrialName                              | PROJECTNAME |
| 0040a124 | UID                                    | hashuid     |
| Group    | unspecifiedelements                    | keep        |
| 0040a088 | VerifyingObserverIdentificationCodeSeq | remove      |
| 0040a075 | VerifyingObserverName                  | empty       |
| 0040a073 | VerifyingObserverSequence              | remove      |
| 0040a027 | VerifyingOrganization                  | remove      |
| 00384000 | VisitComments                          | keep        |

More Details regarding TCIA de-identification may be found at the following links: [De-Identification Rules](#).