RAPTOR Protocol Library Tech Guide

Contents

[Overview](#h.30j0zll)

[Protocols](#h.3znysh7)

[Scanned Images](#h.2et92p0)

[Protocol Matching Values](#h.tyjcwt)

[Protocol Administrative Metadata](#h.1t3h5sf)

[Protocol Template Values](#h.2s8eyo1)

[Value Encoding Scheme](#h.3rdcrjn)

[Hydration Encoding](#h.26in1rg)

[Example JSON Encodings](#h.lnxbz9)

[Contrast Encoding](#h.35nkun2)

[Example JSON Encodings](#h.1ksv4uv)

[Sedation JSON Encoding](#h.44sinio)

[Example JSON Encodings](#h.2jxsxqh)

[Consentreq Encoding](#h.z337ya)

[Example JSON Encodings](#h.3j2qqm3)

[Protocolnotes Encoding](#h.1y810tw)

[Examnotes Encoding](#h.4i7ojhp)

[Use Cases](#h.2xcytpi)

[Initial Population of Library](#h.1ci93xb)

[Improvement to an existing Protocol](#h.3whwml4)

[New Technologist on Site Learning Site Practices](#h.2bn6wsx)

[Enterprise Level Comparison of Peer Sites](#h.qsh70q)

[Architecture](#h.3as4poj)

[Administration](#h.1pxezwc)

[Revision History](#h.49x2ik5)

**Tables**

[Table 1 – Aspects of Protocol Library Content](#h.1fob9te)

[Table 2 – Protocol Values](#h.3dy6vkm)

[Table 3 – Protocol Administrative Metadata](#h.4d34og8)

[Table 4 – Protocol Template Values](#h.17dp8vu)

# Overview

Hospitals have traditionally had a “Protocol Notebook” in which the Radiologists maintain the set of official protocols for their site on paper. The RAPTOR application will have a library for of the notebook content for users and the system to access as needed. There are three aspects to the Protocol Library content as described in Table 1 .

*Table 1 – Aspects of Protocol Library Content*

|  |  |  |
| --- | --- | --- |
| Aspect | Value Type | Description |
| Raw Protocol Document | Scanned Document Image | A PDF containing a scanned image of the original paper-based protocol document. |
| Protocol Matching Values | Programmatically accessible field data | Key information about the protocol stored in a format that the program can index and utilize for matching operations.  E.g., Modality (such as CT, MR, etc) , and weighted keywords (such “Head”, “Neck” etc). |
| Protocol Administrative Metadata | Administrative information | Information to tell the system if the protocol is still active and when it was introduced into the library. |
| Protocol Template Values | Programmatically accessible candidate values | When Radiologist selects a protocol, the system knows to propose the input values associated with the selected protocol.  These are values that have already been identified for pre-population of fields when this protocol is selected. (E.g., 50cc H20) |

# Protocols

The protocol documents describe the best practices of the imaging department for various combinations of patient and imaging factors. There can be any number of protocol documents and they vary in content and standards from site to site.

## Scanned Images

Having access to the original paper based protocol document is still important until a complete transition to an online based library is vetted for completeness and use case appropriateness. The images of the protocol documents will be available in the library as PDF documents (“scanned images”).

|  |  |
| --- | --- |
| **NOTE** | RAPTOR cannot read or edit the content of the scanned images. They are simply available for user viewing. |

## Protocol Matching Values

The system can use the attributes shown in Table 2 to propose reasonable protocols for the Radiologist based on information found in an order.

*Table 2 – Protocol Values*

|  |  |  |
| --- | --- | --- |
| Attribute | Value Type | Description |
| Protocol Short Name | Text  (20 char) | The unique name for this protocol |
| Protocol Long Name | Text  (100 char) | This is the name that is presented to users when selecting a protocol.  This should be a descriptive name of the protocol that is unique within the notebook of a site. It is not required to be unique across sites. |
| Modality | Keyword | The modality to which this protocol applies.   * CT * FL * IR * MR * NM * US |
| Anatomy Keywords | List of Keywords | List of keywords for the anatomy to which this protocol applies. |
| Weight | Optional Weight Range | Lower and upper bound of patient weight to which this protocol applies. |
| Image Guided | Yes/No | If yes, then this is a protocol for an image guided procedure. |
| Contrast | Yes/No | If yes, then this is a protocol for utilization of contrast. |
| Sedation | Yes/No | If yes, then this is a protocol that contains instructions for sedation. |

## Protocol Administrative Metadata

For traceability and patient safety reasons, a protocol cannot be edited or deleted once it is shared in the library. Instead of removing or editing a shared protocol, it can be deactivated.

If a protocol is enhanced, the original protocol in the library is marked as no longer active and the new protocol is uploaded with a new *ProtocolID* value.

*Table 3 – Protocol Administrative Metadata*

|  |  |  |
| --- | --- | --- |
| Attribute | Value Type | Description |
| ProtocolID | Text | A unique identifier for this uploaded protocol. The ID has three parts as follows, each separated by a dash:   * *SiteID* – Each site has a three digit unique identifier * *ShortName* – Each protocol has a short name that is 20 characters or less. We recommend RADLEX ID as this value. * *VersionNumber* – The first version is 1, replacements have higher version numbers.   Example protocol names for site 262 would be as follows:   * S262-RPID18-v1 * S262-RPID16-v1 * S262-RPID145-v1 |
| Uploaded Date | DateTime | Date and time the protocol image and metadata were uploaded |
| Active Status | Yes/No | If yes, the protocol is available for use in new orders. Otherwise, protocol can no longer be used for new orders. |

|  |  |
| --- | --- |
| **NOTE** | Additional metadata, not shown in this document, is captured for security and audit trail purposes. |

## Protocol Template Values

The system can use the attributes shown in Table 4 to propose candidate values for the protocol input fields.

*Table 4 – Protocol Template Values*

|  |  |  |
| --- | --- | --- |
| Attribute | Value Type | Description |
| Protocol ID | Text | This matches the unique ID of a protocol in the library. |
| Version Number | Number | The system will always use the latest template, all others are ignored. |
| Active Status | Yes/No | If this is no, then the template is ignored. Use this if you want to disable all templates for a protocol. |
| Hydration | Complex | Possible setting is any one of the following…   1. **None** 2. **Oral** followed by a value 3. **IV** followed by a value |
| Contrast | Complex | Possible settings **None** or any of the following…   * **Enteric** followed by a value * **IV** followed by a value |
| Allergy | Complex | No default value is supported here. |
| Claustrophobic | Complex | No default value is supported here. |
| Sedation | Complex | Possible setting is any one of the following…   1. **None** 2. **Oral** followed by a value 3. **IV** followed by a value |
| Consent Required | Keyword | One of the following choices:   1. **Unknown** 2. **Yes** 3. **No** |
| Protocol Notes | Text | Text appearing is prepopulated into the protocol notes. |

# Value Encoding Scheme

At runtime, RAPTOR encodes the default values using an encoding scheme as follows that depends on the following three attributes per value:

1. Section Name
2. Category Name
3. Selection

The possible values for **Section Name** are as follows…

* hydration
* contrast
* sedation
* consentreq
* protocolnotes
* examnotes

All values that are encoded on an html page are encoded using the JSON format. Sample snippet of PHP code to produce JSON encoding like this…

$**value** = array(

'hydration' => array('oral' => the oral hydration value here'),

'sedation' => array('iv' => 'the iv sedation value here'),

'contrast' => array('enteric' => 'the enteric contrast value here', 'iv' => 'the iv contrast value here'),

'consentreq' => 'yes',

'protocolnotes' => -1,

'examnotes' => -1,

$**template\_json** = json\_encode($**value**);

Note in the above example no default values were provided for *protocolnotes* and *examnotes*. It is important that the value -1 be provided to indicate that there is no default selection.

## Hydration Encoding

The encoding scheme is **Section Name** containing **Category Name** followed by optional **Selection** followed by **Optional Text.**

When **Category Name** is value “None”, then there are no other values.

When **Category Name** is value “Oral” or “IV” then ID is expected. If optional text is supplied, it is assumed to be associated with “OTHER” and will be appended to the protocol notes. Only Oral or IV can be provided, not both.

### Example JSON Encodings

* {“hydration”: “none”}
* {“hydration”:{“oral” : “OH\_1\_001”}}
* {“hydration”:{”iv”:”IVH\_2\_001”}}
* {“hydration”:{”iv”:{”OTHER”:”In Pt NS 2-3 mL/kg/hr 12 hr pre & postscan”}}}

## Contrast Encoding

The encoding scheme is **Section Name** followed enclosing one or more **Category Name** items, each of which is followed by optional **Selection** followed by **Optional Text.**

When **Category Name** is value “None”, then there are no other values.

When **Category Name** is value “Oral” or “IV” then ID is expected. If optional text is supplied, it is assumed to be associated with “OTHER” and will be appended to the protocol notes. Both Oral and IV can be provided.

### Example JSON Encodings

* {“contrast”:”none”}
* {“contrast”:{”oral:”OC\_3\_001”,”IV”:”IVC\_1\_001”}}
* {“contrast”:{“oral”:”OC\_3\_001”}}
* {“contrast”:{”iv”:”IVC\_1\_001”}}
* {“contrast”:{”oral”:{”OTHER”:”GastroView prior to exam”}}}

## Sedation JSON Encoding

The encoding scheme is **Section Name** containing **Category Name** followed by optional **Selection** followed by **Optional Text.**

When **Category Name** is value “None”, then there are no other values.

When **Category Name** is value “Oral” or “IV” then ID is expected. If optional text is supplied, it is assumed to be associated with “OTHER” and will be appended to the protocol notes. Only Oral or IV can be provided, not both.

### Example JSON Encodings

* {“sedation”:”none”}
* {“sedation”:{”oral”:”OS\_2\_001”}}
* {“sedation”:{”iv”:”IVS\_1\_001”}}

## Consentreq Encoding

The encoding scheme is **Section Name** followed by colon followed by optional **Category Name.** There are no other values in the encoding.

### Example JSON Encodings

* {“consentreq”:”none”}
* {“consentreq”:”yes”}
* {“consentreq”:”no”}

## Protocolnotes Encoding

The encoding scheme is **Section Name** followed by colon followed by optional **Optional Text.** There are no other values in the encoding.

## Examnotes Encoding

The encoding scheme is **Section Name** followed by colon followed by optional **Optional Text.** There are no other values in the encoding.

# Use Cases

## Initial Population of Library

TODO

## Improvement to an existing Protocol

TODO

## New Technologist on Site Learning Site Practices

TOOD

## Enterprise Level Comparison of Peer Sites

TODO

# Architecture

The protocol library is implemented as a service on the same web server that serves up RAPTOR content.

# Administration

The protocol content is not sensitive information and is available for reading by all users of RAPTOR. Ability to uploaded new protocols and disable existing protocols is limited to designated user accounts.

# Revision History

|  |  |  |
| --- | --- | --- |
| When | Who | What |
| 20140315 | FJF & AC | Initial draft , updated with AC. |
| 20140317 | FJF | Added encoding details. |
| 20140419 | FJF | Sample PHP code added and some typo corrections. |
| 20140524 | FJF & AC | Updated name information |