Chart Review

User Manual

Version 1.0

Oct 2014

Department of Veterans Affairs (VA)

VINCI

Revision History

Table 1. Documentation revision history

Date	Revision	Description	Author
10/20/2014	1.0	• Initial version	• Brad Adams

REF: This is an initial version of the user manual

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Orientation

What is Chart Review?

Chart Review is a manual, multi-level annotation tool. Its configurable medical record interface, allows annotation at any level of the record (i.e. note part or whole, lab value part or whole, patient part or whole, etc.) in a configurable, multi-annotator workflow. Annotating within the context of the whole patient chart allows reviewers to follow a more natural clinical process of finding and aggregating patient information, while still supporting powerful annotation capabilities.

Chart Review displays all aspects of a medical record, from any database environment. Though Chart Review was built to specifically allow its use in the VINCI research environment (taking into account the VINCI project database configuration and policies), it can be used in any database environment where medical records may be kept. Access to the data layer is configurable in the UI, allowing the tool to access any database environment, with any database schema definition.

The tool also allows configuration of annotation workflow processes which make annotation tasks available to multiple annotators using the application simultaneously. Annotations are saved and viewable in downstream tasks and processes, whether inside or outside of the system. This tool can share inputs and outputs with other NLP processes and annotation tools through standard definitions and standard access of clinical elements (i.e. documents, records) and annotations. In addition, annotation statistics are provided for workflow analysis.

Chart Review provides features such as:

- Definition of clinical elements (notes, labs, radiology, problems, meds, etc.)
- Definition of available process types (single step, multi-step, graph, etc.)
- Definition of projects (users, workflow processes, tasks, views, cohorts, and mapping to the data source, etc.)
- Reports (workflow process, annotation activity, etc.)
- User definition
- Project workflow maintenance and trouble shooting tools and utilities
- System performance monitoring
- System help

The features of Chart Review listed above may only be accessible to users with certain roles and privileges. A typical annotator, for example, may not have access to the project definition features that are available to a project coordinator.

Chart Review is a public domain software package that is developed and maintained by the Department of Veterans Affairs. It is widely used in the VA VINCI research environment as well as in university settings. It may be used in commercial settings in the future.

How to Use this Manual

The *Chart Review User Manual* is designed to provide you, the Chart Review user, with screen-by-screen "*how to"* information on the usage of Chart Review.

This manual is divided into two main sections: Chart Review System and Project Administration, and Reviewing a Chart. The manual will provide explanations of each screen and of all user interface options within the context of an easy to understand demonstration data scenario.

NOTE: This document is available in Microsoft Word (.doc), Adobe Acrobat Portable Document Format (PDF), and Hypertext Markup Language (HTML) format as online-help.

Intended Audience

This manual will distinguish features that are available to project administrators from those available to other project users (i.e. annotators).

Legal Requirements

There are no special legal requirements involved in the use of Chart Review.

Disclaimers

This manual provides an overall explanation of Chart Review and the functionality contained in Chart Review 1.0; however, no attempt is made to explain how the reader may access the VINCI environment or procure and view data within that environment. We suggest contacting VINCI management directly from the VA network at vaww.vinci.med.va.gov.

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Documentation Conventions

This manual uses several methods to highlight different aspects of the material:

- Various symbols are used throughout the documentation to alert the reader to special information. Table gives a description of each of these symbols:

Table 1. Documentation symbol descriptions

Symbol	Description
	**NOTE/REF:** Used to inform the reader of general information including references to additional reading material.
	**CAUTION/RECOMMENDATION/DISCLAIMER:** Used to caution the reader to take special notice of critical information.

Assumptions

This manual is written with the assumption that the reader is familiar with the following:

- SQL – there will be many references to SQL code in setting up a project's mapping to a data source.

References / Online Demo

Readers who wish to learn more about Chart Review should consult the following documents:

- *Chart Review Release Notes* (TBD)
- *Chart Review Installation Guide* (TBD)
- *Chart Review Technical Manual* (TBD)
- *Chart Review User Manual* (this manual; PDF and HTML format)
- *Chart Review Developer's Guide* (TBD)

ONLINE DEMO: A demo of Chart Review and its online help is available on the VA intranet at: http://vhacdwweb03:8080/chart-review/ Using a Fire Fox (ver > 30) browser, open Chart Review and, after logging in as admin/admin (project administrator features) or project1/project1 (annotator features), access the help link at the top of the page.

1 Introduction

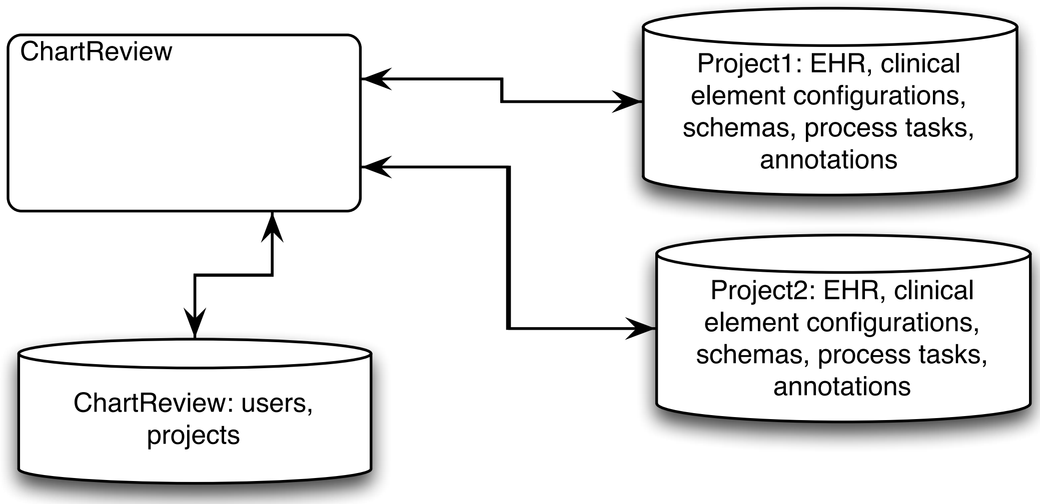
1.1 System Architecture Must-Knows

In defining annotation project workflow processes, it benefits the user to understand some basic concepts about the architecture of data sources in Chart Review. First, Chart Review stores information that is central to the application and shared by all projects, such as user profiles, the list of projects in a central database. This information is assumed to not require special security maintained by an outside security manager.

Next, Electronic Health Record information is usually stored in a database that is securely maintained by an outside security manager. In the case of VINCI data, for example, the VINCI data management team places the data in project specific databases and individual end users are given permissions to those databases and tables. When a user logs into Chart Review, his permissions are passed on to the database system when he tries to access project specific information. He will only be able to see EHR and project specific data, such as annotation process tasks and annotations in project databases for which he has been given permission by the data management team. In defining and annotation project workflow process in the Chart Review tool, a project coordinator will need to specify database connectivity information and provide SQL queries to access EHR information. Please note that errors in the definition of these configuration elements may be the result of database access permissions that are not controlled by the Chart Review tool.

Finally, Chart Review stores other annotation project information that is project specific in the project database along with the EHR information, including clinical element definitions, annotation schemas, workflow process tasks, as well as annotations. These data elements may contain secure information if, for example, a clinical element configuration (the SQL used to query/transform EHR data into data viewed in Chart Review) contained a list of patient ids as a criteria.

Figure 1: Chart Review Data Sources

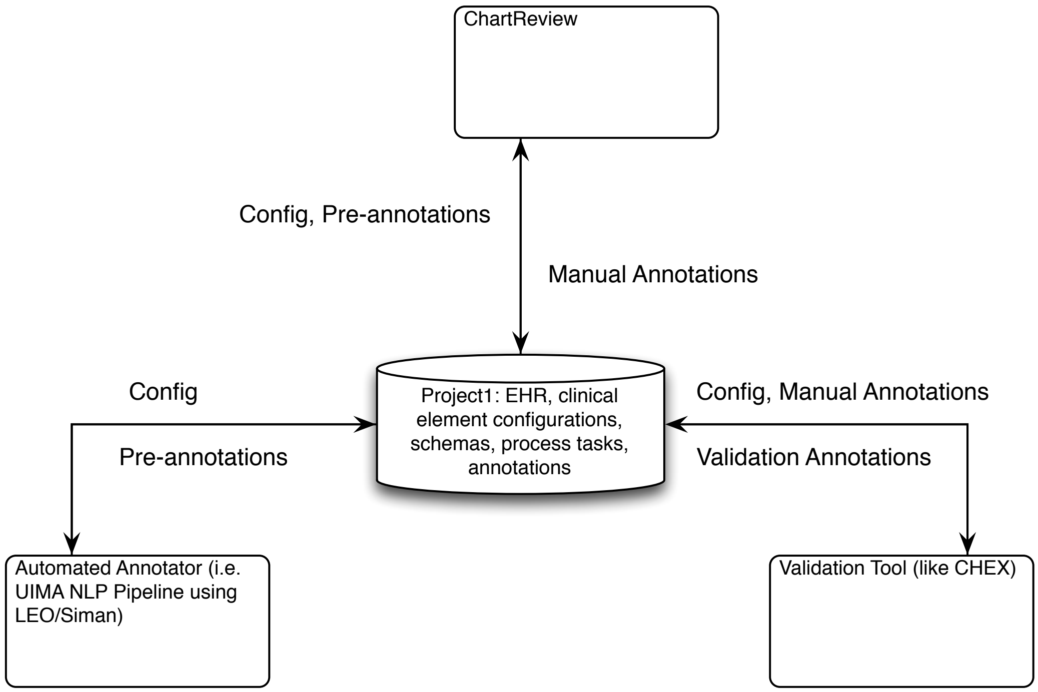


1.2 System Integration Must-Knows

In defining annotation project workflow processes, it benefits the user to understand some basic concepts about the way other systems can be integrated with Chart Review. For example, an automated annotation system, like one based on the LEO or SIMON frameworks, may be used to automatically generate symptoms or other pre-annotations that can then be seen by a manual annotator in the Chart Review tool to help them with their annotation tasks. The LEO and SIMON frameworks allow these tools to share clinical element configurations and schemas, and to generate pre-annotations that can be seen in Chart Review. The automated annotator may first pull clinical element definitions from the project database. These elements allow the system to understand what a "document" that needs to be annotated looks like (i.e. its content and format). This document may be a traditional note, or it may be a lab, problem, medication list, patient demographic record, etc. It is important that both the automated annotation system and the Chart Review system agree on what a given clinical element looks like so that annotations created on that element by the one system can be seen correctly in the other system. Next, sharing schemas allows the automated annotator to generate annotations that relate to classifications and have class attributes and relationships that may then be understood and viewed in Chart Review. Process tasks could be utilized by both systems to sequence the pre-annotation task with the manual annotation task.

As another example of integration, there may be a validation tool that would take the manual annotations created in Chart Review and allow an analyst to do a quick validation of the given annotation in a validation tool like CHEX. Similar to an automated annotation tool, a validation tool would use the configuration information such as clinical element configurations, schemas, and process tasks as well as the manual annotations created in Chart Review to allow an analyst to validate the annotations and produce validation annotations, confirming the validity of the manual annotations. These validation annotations could subsequently be viewed in Chart Review.

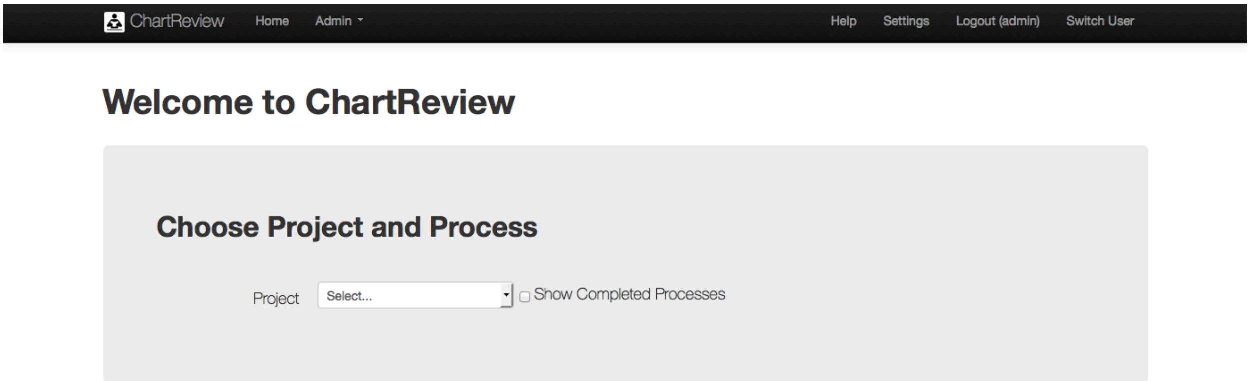
Figure 2: Chart Review Integrations



1.3 The Chart Review Home Page

The Chart Review home page is the main screen from which any user can access all admin features or the chart reviewing features of the tool. The tool bar at the top of the page gives access to the various parts of the application and can be found on every page of the application, allowing the user to jump from one part of the application to another.

Figure 3: Chart Review Home Page



This table lists the features that can be access from the main Chart Review toolbar:

Table 2: Chart Review Main Toolbar

Item/Action	Description/Result
ChartReview	Takes you to this home page again.
Home	Takes you to this home page again.
Admin -> Clinical Element Configurations	Takes you to the pages that allow definition of the various chart information views that will be available to view and annotate during chart review, for example, labs, notes, radiology reports, problems, medications, etc.

Admin -> Projects	Takes you to the pages that allow definition of a project, its processes, tasks, and database mappings, etc.
Admin -> Reports	Takes you to the pages that allow perusal of analytical reports about various aspects of the projects, including task completion, annotations made, inter-annotator agreement, etc.
Admin -> Schemas	Takes you to the pages that allow definition of classifications, class attributes, and class relationships that will be available to annotate the chart with for a each annotation workflow process task.
Admin -> Failed Jobs	Takes you to a list of failed workflow processes. Note that different annotators may be participating in different annotation workflows simultaneously.
Admin -> Processes	Takes you to the pages that allow upload and definition of process pre-defined process templates that may be used in creating process instances for a given project.
Admin -> Tools and Utilities	Takes you to the pages that provide tools and utilities to, for example, kill processes, or view API documentation.
Admin -> Users	Takes you to the pages that allow user definition and maintenance.
Admin -> About	Takes you to the pages that show information about the application, its version, structure, dependencies, and components.
Admin -> Log Level	Takes you to the pages that allow control over the various levels of system logging available.
Admin – Performance Monitoring	Takes you to the pages that show performance monitoring analytics about the Chart Review system itself.

Help	Takes you to the help pages.
Settings	Takes you to the pages that allow system settings, for example, changing the current user's password.
Logout (username)	Logs you out and takes you to the login screen.
Switch User	Takes you to the pages that allow switching between users without changing your database connection permissions.

1.4 Setting up your Browser for Chart Review

Chart Review us available on the Firefox browser only, version 30+.

1.4.1 General Setup

Access to the server may take several seconds, or more, depending upon the underlying database schema and the queries defined in the project processes. Because of this, the browser java script timeout default needs to be set to infinity, to not timeout the scripts. This is done in the Firefox configuration screens by setting max_script_run to zero.

1) In the address area of Firefox, type the following:

About:config

2) In the search area, type the following:

Max_script_run

Double click on the value of this variable, and set it to zero.

1.4.2 Single Sign On (SSO) Setup

See the User Guide for Single Sign On to setup single sign for the VINCI environment. Information in that document contains VA confidential environment information, so it is not include in this document.

2 Admin

2.1 Overview

The Admin pages in Chart Review allow a project administrator to set an annotation project, including: define clinical elements, annotation schemas, and annotation process templates and workflows. It also provides system administration functions such as user management, failure reports, database utilities, logging control and performance monitoring.

2.2 *Project Clinical Element Configurations (User/Admin)*

The Clinical Element Configuration item in the Admin drop down menu takes you to the pages that allow definition of the various chart information views that will be available to view and annotate during chart review, for example, labs, notes, radiology reports, problems, medications, etc. Chart Review gives complete control to a project administrator over defining what the clinical elements are, what data they contain, how they are mapped from a data source, and how they will be viewed during chart review. While these configurations belong to a give project, a user that has permissions to multiple projects is able to copy (not share) configurations between those projects, in the event that data sources and configurations are similar between projects.

Figure 4. Admin – Project Clinical Element Configurations

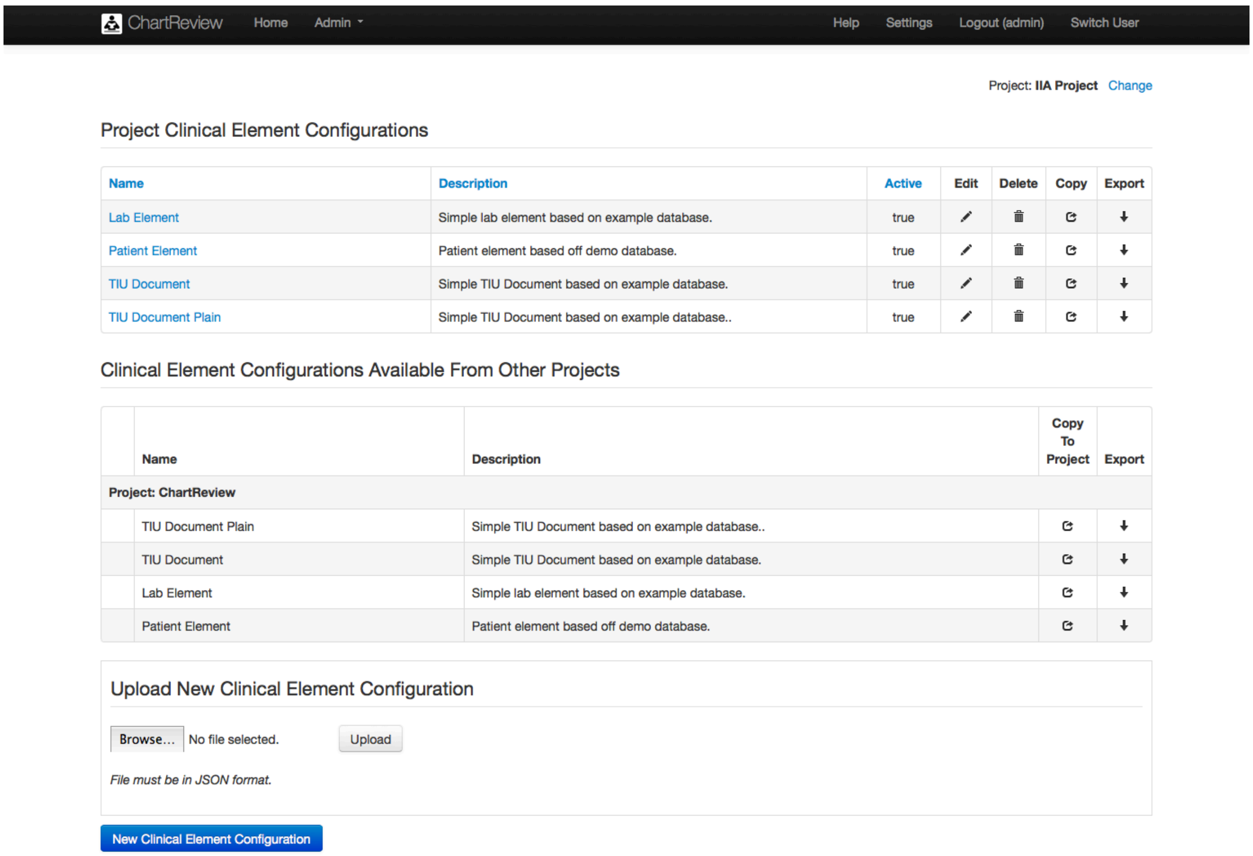


Table 3: Admin – Project Clinical Element Configuration List

Item/Action	Description/Result
New Clinical Element Configuration	Creates a new clinical element configuration and takes you to the clinical element configuration editor.

Project Clinical Element Configurations	This section contains all configurations that belong to this project.
Change	Allows you to change which project's clinical element configurations are listed.
Name link	Sorts table by project clinical element configuration name.
Name	The name of each clinical element configuration owned by the specified project.
List item name	Shows the selected clinical element.
Description link	Sorts table by project clinical element configuration name.
Description	A brief description of the clinical element configuration.
Active link	Sorts table by project clinical element configuration active status.
Active	Indicates if the user can choose this configuration when defining a process. As configurations age, they will be "turned off".
Edit	Edits the specified configuration.
Delete	Deletes the specified configuration.
Copy	Copies the specified configuration.
Export	Exports the specified configuration to JSON in a separate tab.
Clinical Element Configurations Available From Other Projects	This section contains all configurations that belong to projects that the user has access to.
Name	The name of each clinical element configuration belonging to a project the user has access to.

Description	A brief description of the clinical element configuration.
Copy To Project	Copies the specified configuration into the current project.
Export	Exports the specified configuration to a JSON in a separate tab.
Upload New Clinical Element Configuration	Allows the user upload of a configuration specified in a JSON file.
Browse	Find the file in the local browser's file system.
Upload	Upload the configuration.

Figure 5. Admin – Show Clinical Element Configuration – General Configuration

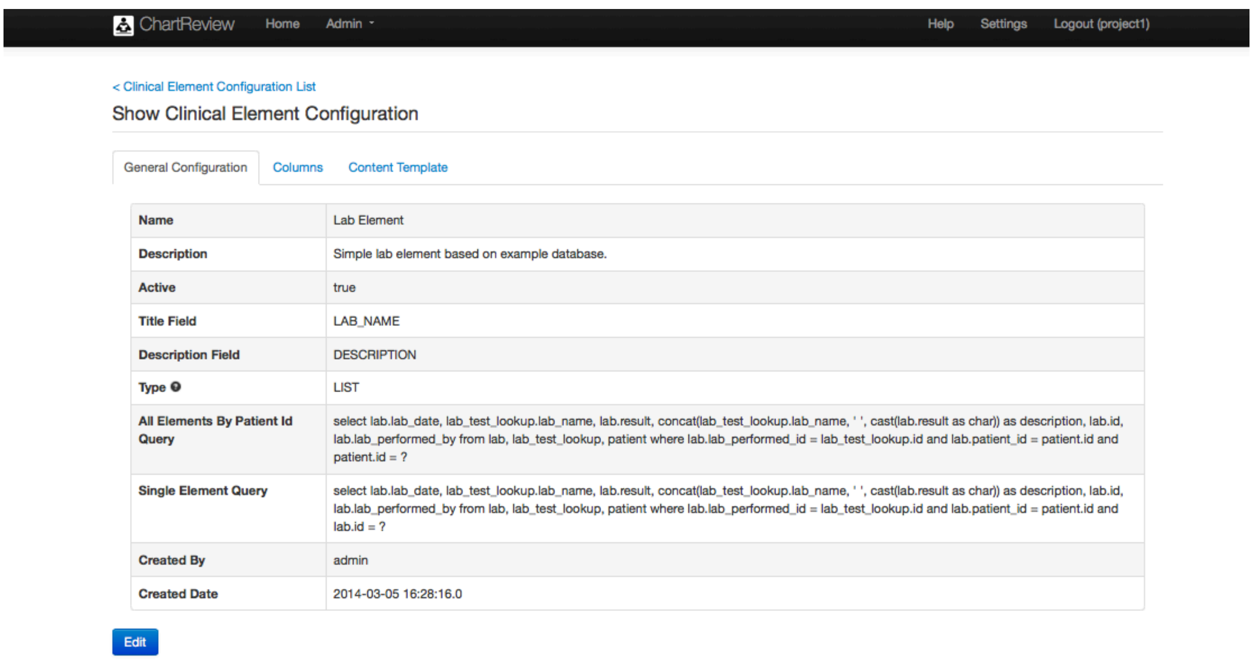


Table 4: Admin – Show Clinical Element Configuration – General Configuration

Item/Action	Description/Result

Name	Name of the configuration.
Description	Simple description of the configuration.
Active	Indicates if the user can choose this configuration when defining a process. As configurations age, they will be "turned off".
Title Field	The database field that is the title of this configuration.
Description Field	The database field that is the description of this configuration.
Type	The type of this clinical element configuration. Summary is one record per primary clinical element (patient), list is multiple records per principal clinical element (patient).
All Elements By Patient Id Query	Queries all context clinical elements by the principal clinical element id (i.e the patient id). For example, this query could return all elements of this type that belong to a given patient (plus any other desired criteria). This SQL queries a project database.
Single Element Query	Queries a single clinical element of this type. The goal of this query is to return a single record by specifying any criteria in the where clause that are needed to identify the record uniquely. The criteria may include the relationship to the principal clinical element (i.e. the patient), but does not have to. The record id alone could be the only criteria, in the most simple case. This SQL queries a project database.
Created By	The user that created the configuration.
Created Date	The date that the configuration was created.

Figure 6. Admin – Show Clinical Element Configuration – General Configuration – Edit

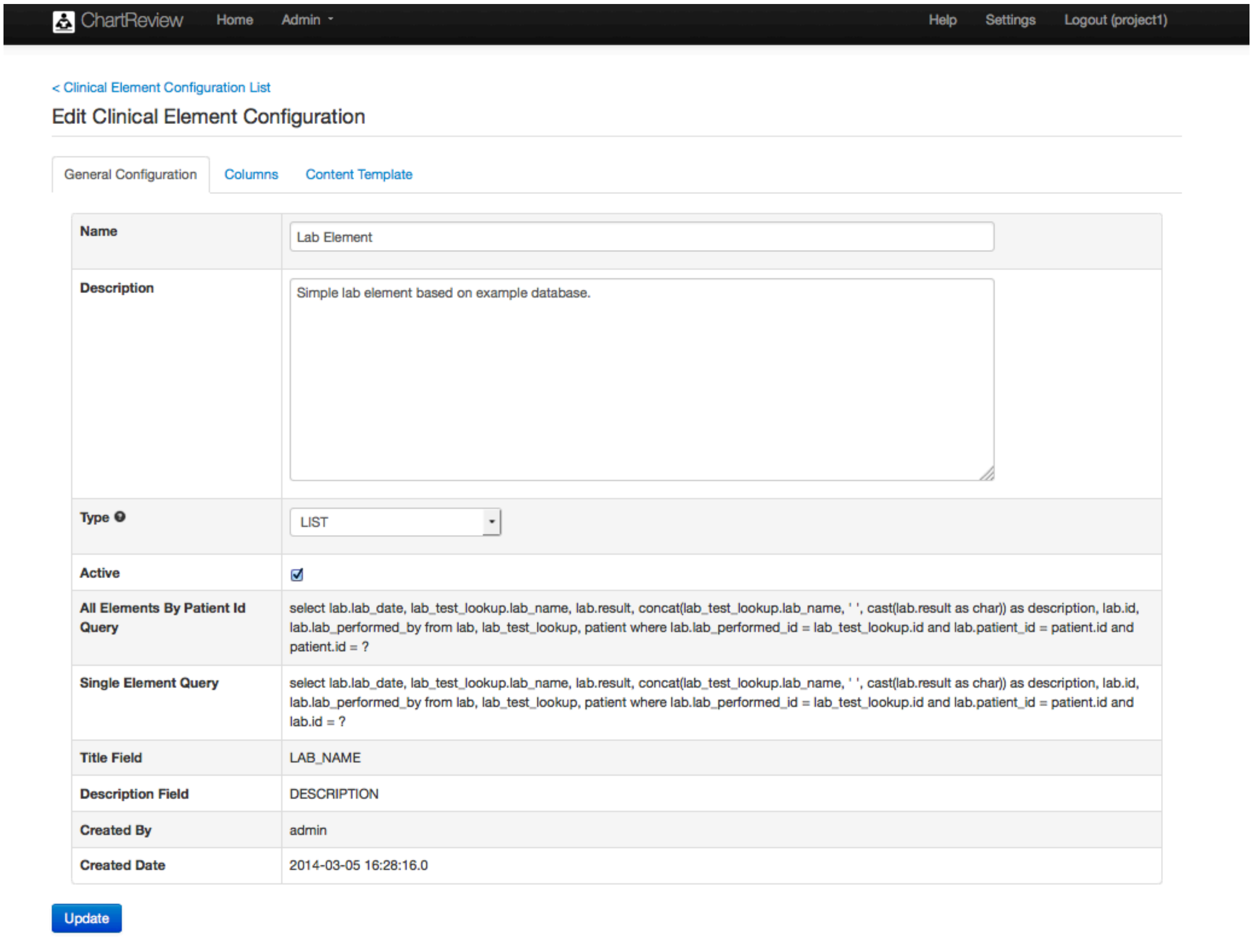


Table 5: Admin – Show Clinical Element Configuration – General Configuration - Edit

Item/Action	Description/Result
Name	Name of the configuration.
Description	Simple description of the configuration.
Type	LIST – The clinical element view shows a list of clinical element items (like note documents), with a detail section that is displayed when an item is selected. SUMMARY – The clinical element view shows only a summary of the clinical element item(s) (like

	an overview of a patient's demographic information, or a graph of all labs through time).
Active	Indicates if the user can choose this configuration when defining a process. As configurations age, they will be "turned off".
All Elements By Patient Id Query	Queries all context clinical elements by the principal clinical element id (i.e the patient id). For example, this query could return all elements of this type that belong to a given patient (plus any other desired criteria). This SQL queries a project database.
Single Element Query	Queries a single clinical element of this type. The goal of this query is to return a single record by specifying any criteria in the where clause that are needed to identify the record uniquely. The criteria may include the relationship to the principal clinical element (i.e. the patient), but does not have to. The record id alone could be the only criteria, in the most simple case. This SQL queries a project database.
Title Field	The database field that is the title of this configuration.
Description Field	The database field that is the description of this configuration.
Created By	The user that created the configuration.
Created Date	The date that the configuration was created.
Update	Saves the edits to the configuration.

Figure 7. Admin – Show Clinical Element Configuration – Columns

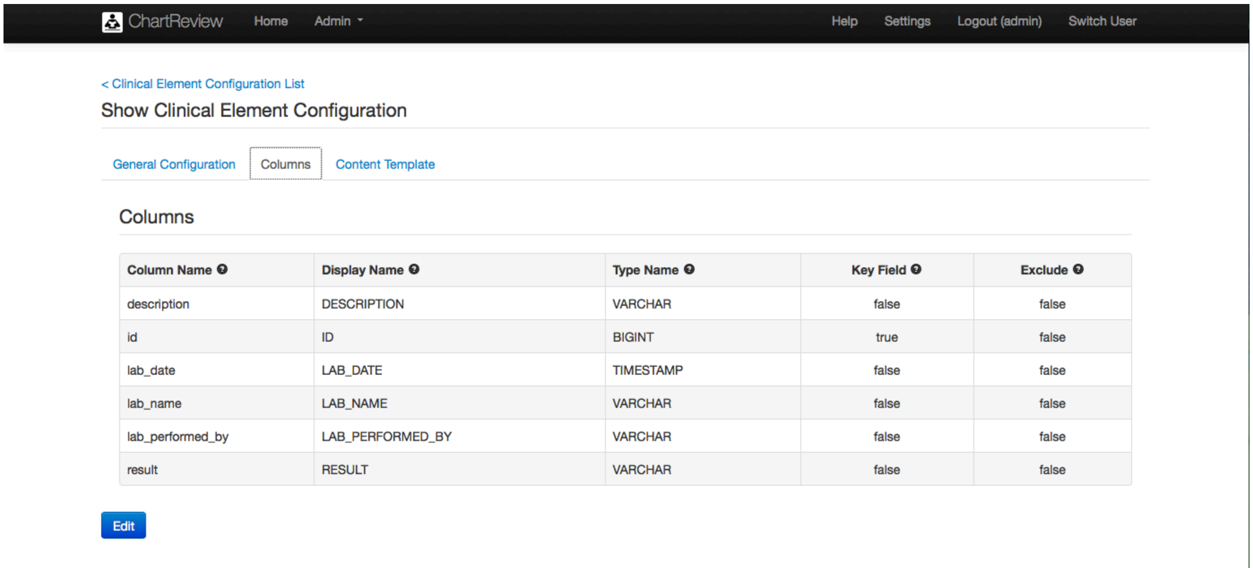


Table 6: Admin – Show Clinical Element Configuration – Columns

Item/Action	Description/Result
Column Name	The column name from the result set
Display Name	The name that will be presented as the name of the clinical element view during chart review.
Type Name	The database type for the column.
Key Field	Key fields in the database should be true. Others, false.
Exclude	Excluded fields are not visible in the item grid during chart review, but are used as part of the detail content template.
Update	Saves the edits to the configuration.

Figure 8. Admin – Show Clinical Element Configuration – Content Template

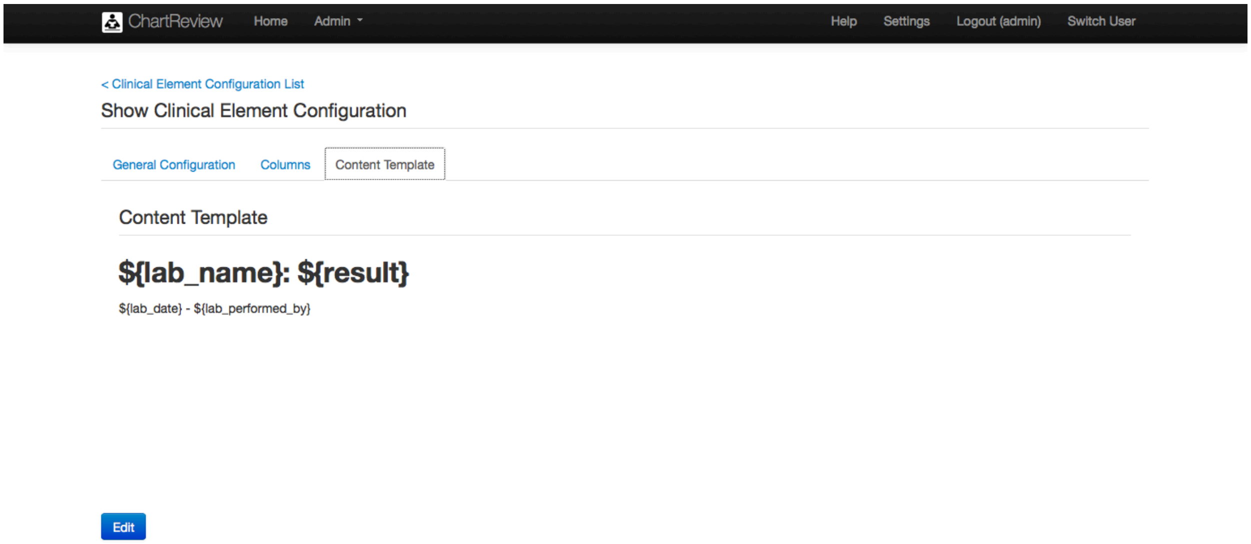


Table 7: Admin – Show Clinical Element Configuration – Content Template

Item/Action	Description/Result
Content Template	The content template is a definition of the format of the detail display of the selected clinical element item during chart review. Database fields are specified as ${field_name}. Other characters are displayed in the detail view as-is. Style can be added to the content by applying it to the template, including the database fields.

Figure 9. Admin – Create Clinical Element Configuration – Step 1 – Define Test Connection and Queries

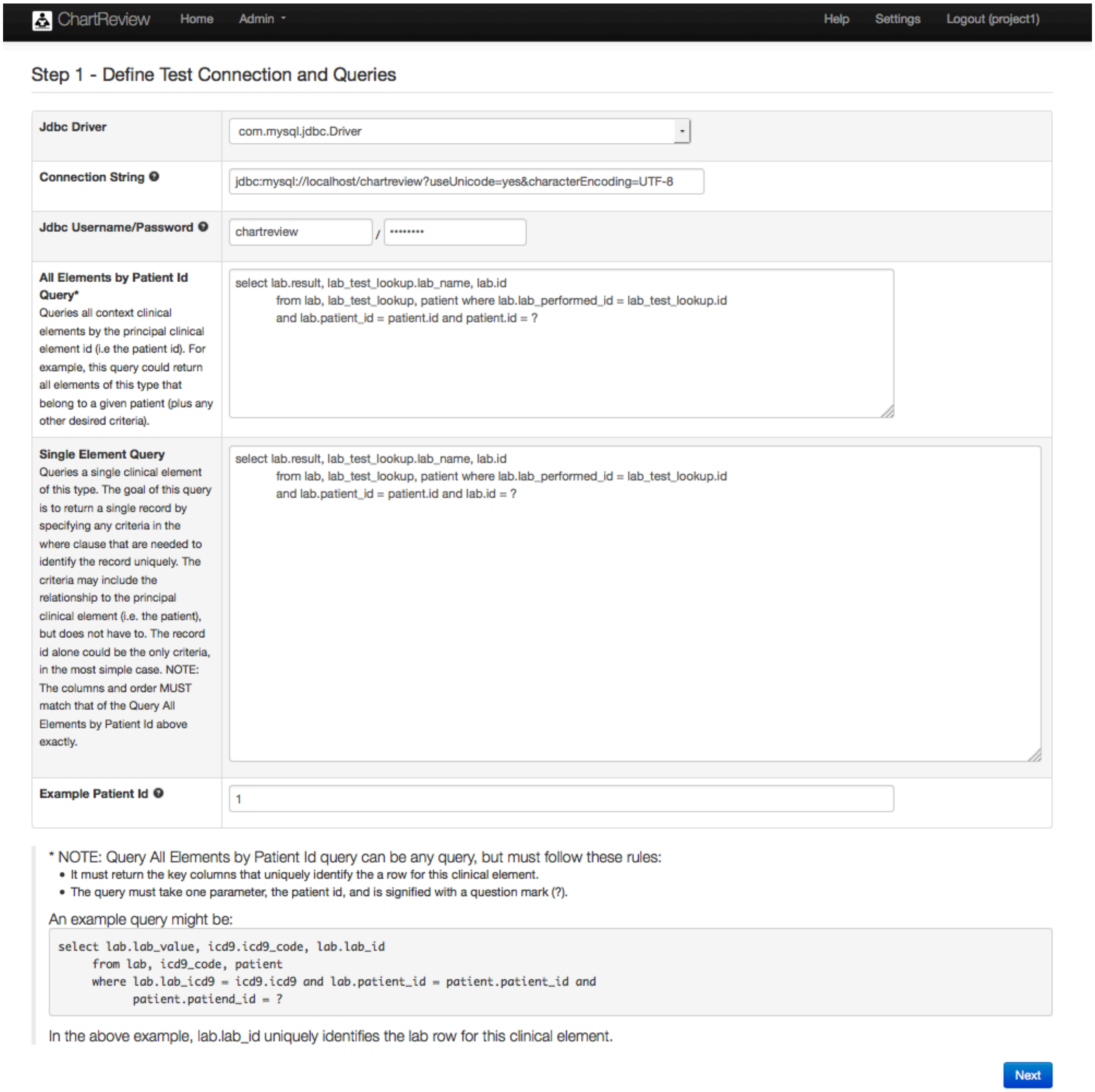


Table 8: Admin – Create Clinical Element Configuration – Step 1 – Define Test Connection and Queries

Item/Action	Description/Result
Jdbc Driver	The jdbc driver that will be used to connect to the database.
Connection String	Standard jdbc database connection string (i.e.

	jdbc:mysql://localhost/chartreview?useUniode=yes&characterEncoding=UTF-8)
Jdbc Username/Password	Username and passw0rd to connect to the databse with. If using integrated authentication, these can be left blank.
All Elements by Patient Id Query	Queries all context clinical elements by the principal clinical element id (i.e the patient id). For example, this query could return all elements of this type that belong to a given patient (plus any other desired criteria). NOTE: Query All Elements by Patient Id query can be any query, but must follow these rules: • It must return the key columns that uniquely identify a row for this clinical element. • The query must take one parameter, the principal clinical element id (i.e. the patient id), and is signified with a question mark (?). An example query might be: `select lab.lab_value, icd9.icd9_code, lab.lab_id from lab, icd9_code, patient where lab.lab_icd9 = icd9.icd9 and lab.patient_id = patient.patient_id and patient.patiend_id = ?` In the above example, lab.lab_id uniquely identifies the lab row for this clinical element.
Single Element Query	Queries a single clinical element of this type. The goal of this query is to return a single record by specifying any criteria in the where clause that are needed to identify the record uniquely. The criteria may include the relationship to the principal clinical element (i.e. the patient), but does not have to. The record id alone could be the only criteria, in the most simple case. NOTE: The columns and order MUST match that of the Query All Elements by Patient Id above exactly.
Example Patient Id	An example patient id for querying the database to get table metadata.
Next	Go to the next step in the Create Clinical Element Configuration wizard.

Figure 10. Admin – Create Clinical Element Configuration – Step 2 – Data Set Column Definition & Other Metadata

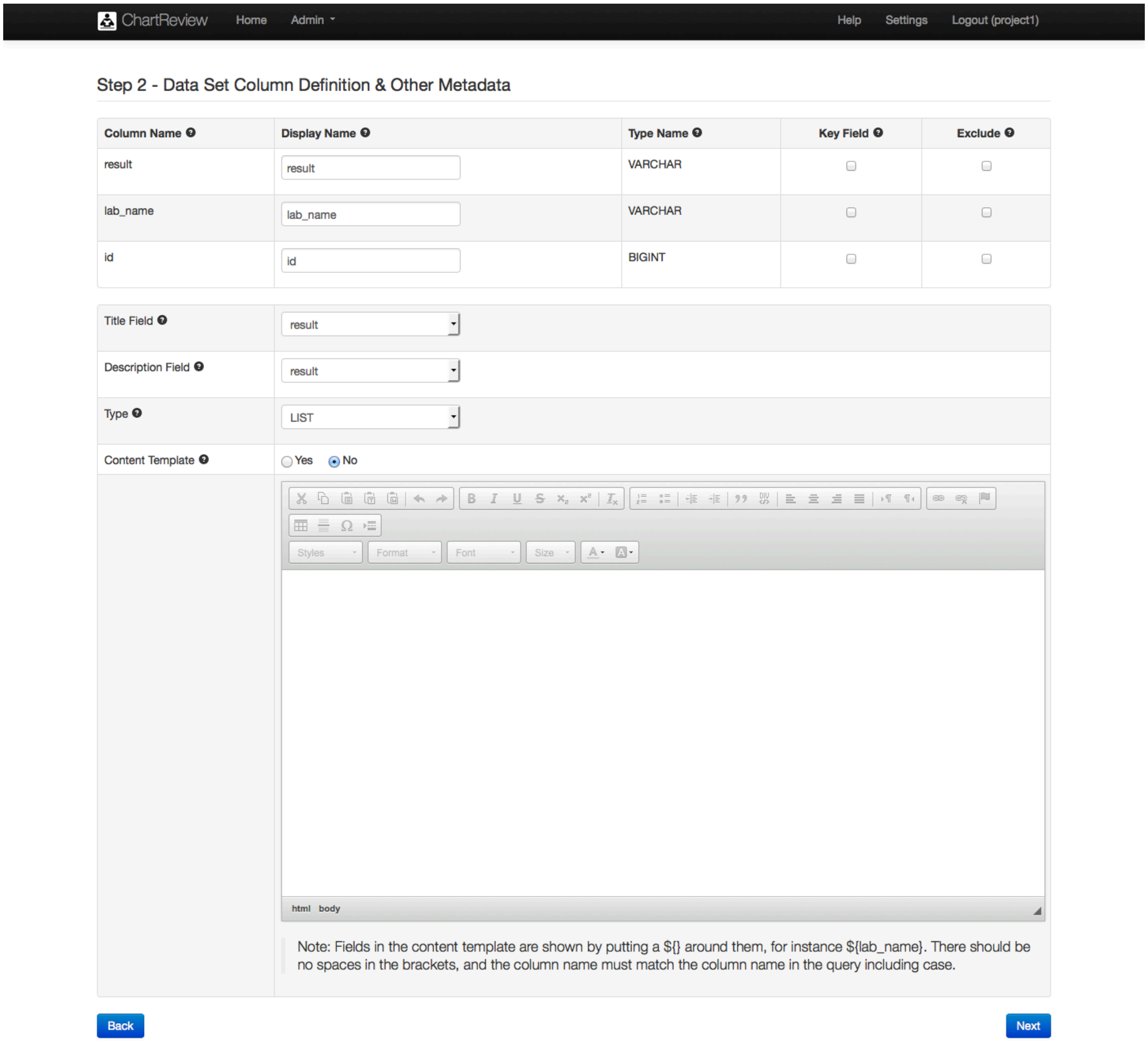


Table 9: Admin – Create Clinical Element Configuration – Step 2 – Data Set Column Definition & Other Metadata

Item/Action	Description/Result
Column Name	The column name from the result set
Display Name	The name that will be presented as the name of the clinical element view during chart review.
Type Name	The database type for the column.

Key Field	Key fields in the database should be true. Others, false.
Exclude	Excluded fields are not visible in the item grid during chart review, but are used as part of the detail content template.
Title Field	The database field that is the title of this configuration.
Description Field	The database field that is the description of this configuration.
Type	LIST – The clinical element view shows a list of clinical element items (like note documents), with a detail section that is displayed when an item is selected. SUMMARY – The clinical element view shows only a summary of the clinical element item(s) (like an overview of a patient's demographic information, or a graph of all labs through time).
Content Template Toggle	Yes if this configuration has a content template, No otherwise. A LIST type configuration usually has a content template that displays the detail of a clinical element record in a formatted document way. There may be cases where a LIST type configuration may just be displayed in a list, with no detailed, document view if a document view does not add any information that would not be seen in the columns of the clinical element grid in Chart Review, and if annotation never needed to occur on text within the detail. If there were no content template provided, an entire clinical element record could still be annotated as a whole within Chart Review. A SUMMARY type configuration must have a content template. This template would display the only view available of the clinical element, because there will be no grid list of clinical element items displayed during Chart Review for a SUMMARY type clinical element configuration.

Content Template	The content template is a definition of the format of the detail display of the selected clinical element item during chart review. Database fields are specified as ${field_name}. Other characters are displayed in the detail view as-is. Style can be added to the content by applying it to the template, including the database fields.
Previous	Go to the previous step in the Create Clinical Element Configuration wizard.
Next	Go to the next step in the Create Clinical Element Configuration wizard.

Figure 11. Admin – Create Clinical Element Configuration – Step 3 – Preview Output

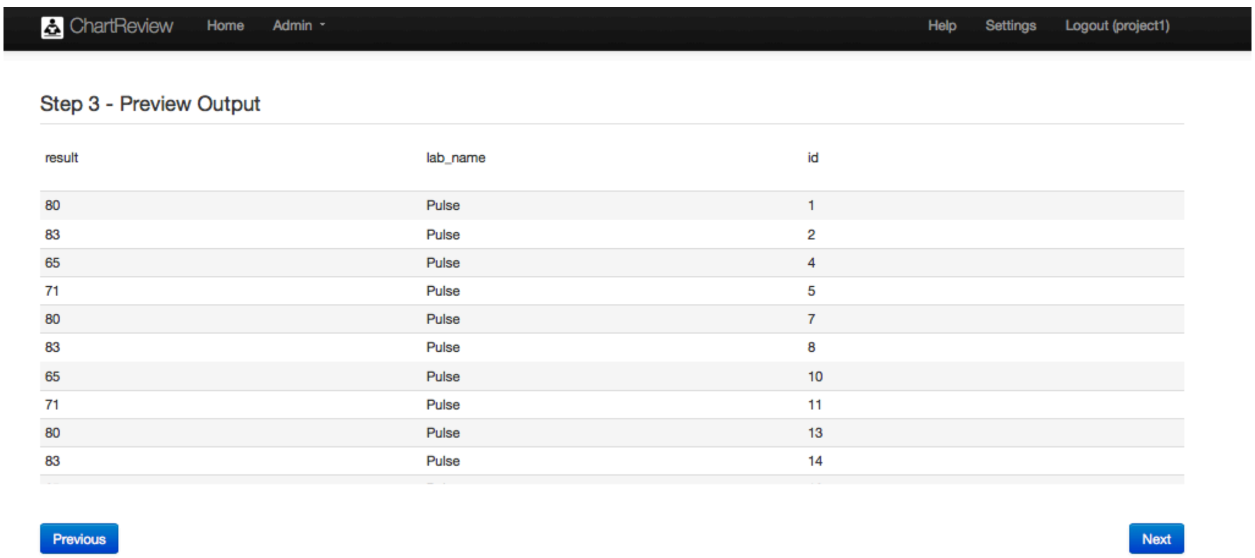


Table 10: Admin – Create Clinical Element Configuration – Step 3 – Preview Output

Item/Action	Description/Result
Previous	Go to the previous step in the Create Clinical Element Configuration wizard.
Next	Go to the next step in the Create Clinical Element Configuration wizard.

Figure 12. Admin – Create Clinical Element Configuration – Step 4 – Name and Description

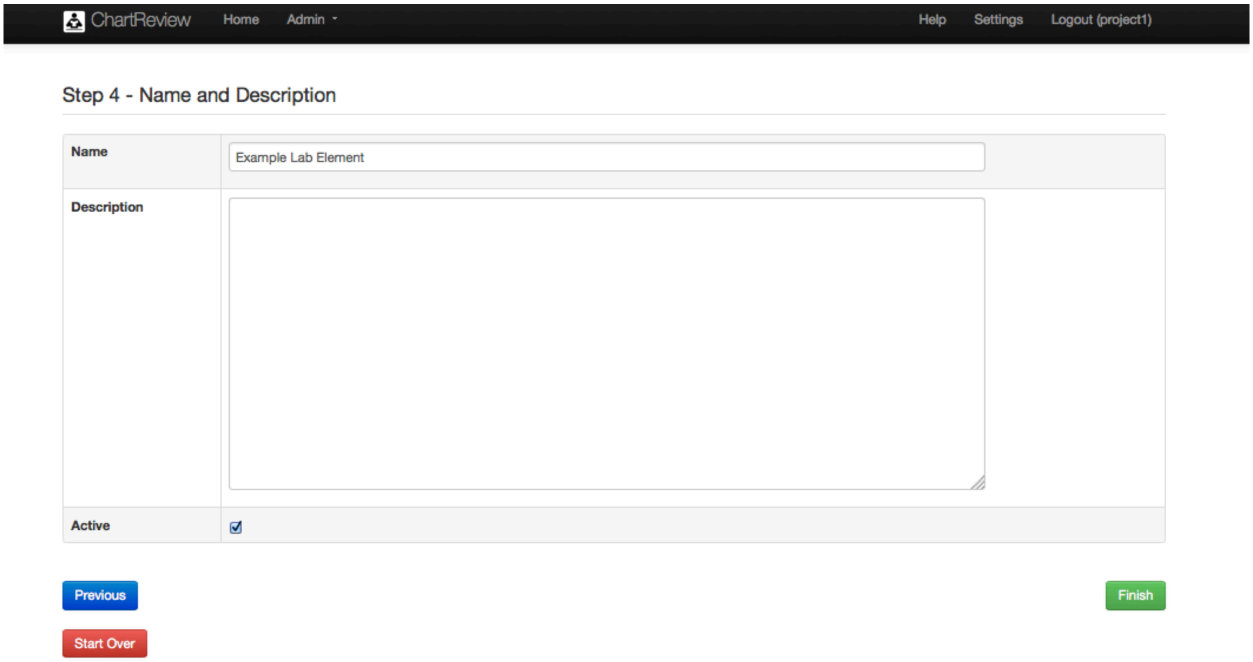


Table 11: Admin – Create Clinical Element Configuration – Step 4 – Name and Description

Item/Action	Description/Result
Name	Name of the configuration.
Description	Simple description of the configuration.
Active	Indicates if the user can choose this configuration when defining a process. As configurations age, they will be “turned off”.
Previous	Go to the previous step in the Create Clinical Element Configuration wizard.
Next	Go to the next step in the Create Clinical Element Configuration wizard.
Start Over	Clear out all data from the wizard and start over defining the clinical element configuration.

2.3 Projects (User/Admin)

The Projects item in the Admin drop down menu takes you to the pages that allow you to define your projects, their processes, tasks, and database mappings, etc. First, an annotation project specifies a connection to a project database. This database will be used to pull clinical element information, the chart, notes, and records that are relevant to the planned chart review workflow. Next, a project has documents that describe the annotation work that is to be done on the project. These may be included as annotation task instructions that will be sent to an annotator that is assigned a task to perform. In addition, a project is associated with system users. While a project is owned by a particular user, other users can be assigned to a project with designated project roles which give them appropriate permissions on that project. Finally, a project defines the annotation process workflows that need to occur to get the work of annotation done on a project. These processes detail the tasks that need to be performed by the annotators, and which tasks require pre-annotations and how generated annotations will be grouped and used.

Project processes utilize pre-loaded process templates that give structure to the process and can be reused by multiple projects. In addition to a process templates, a library of annotation schemas is maintained at the system level, so that they may be reused in multiple projects.

Figure 13. Admin – Project List

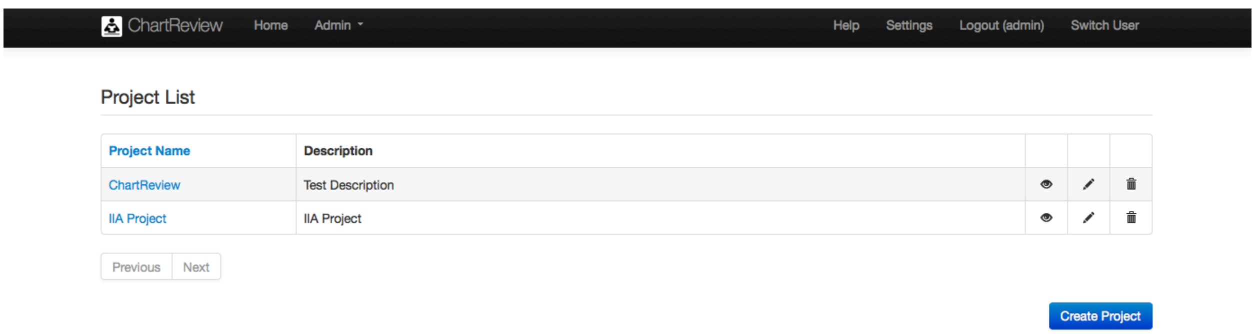


Table 12: Admin – Show Project – General Configuration

Item/Action	Description/Result
Name Column	Sorts the table by project name.
Name link	Takes you to the pages that show the specified project.
Name	The name of the project
Description	A short description of the project.

View	Takes you to the pages show the specified project.
Edit	Takes you to the pages to edit the specified project.
Delete	Deletes the specified project.
Previous	Takes you to the previous page of projects.
Next	Takes you to the next page of projects.
Create Project	Creates a project and takes you to the pages to edit that project.

Figure 14. Admin – Project – Show – General Configuration

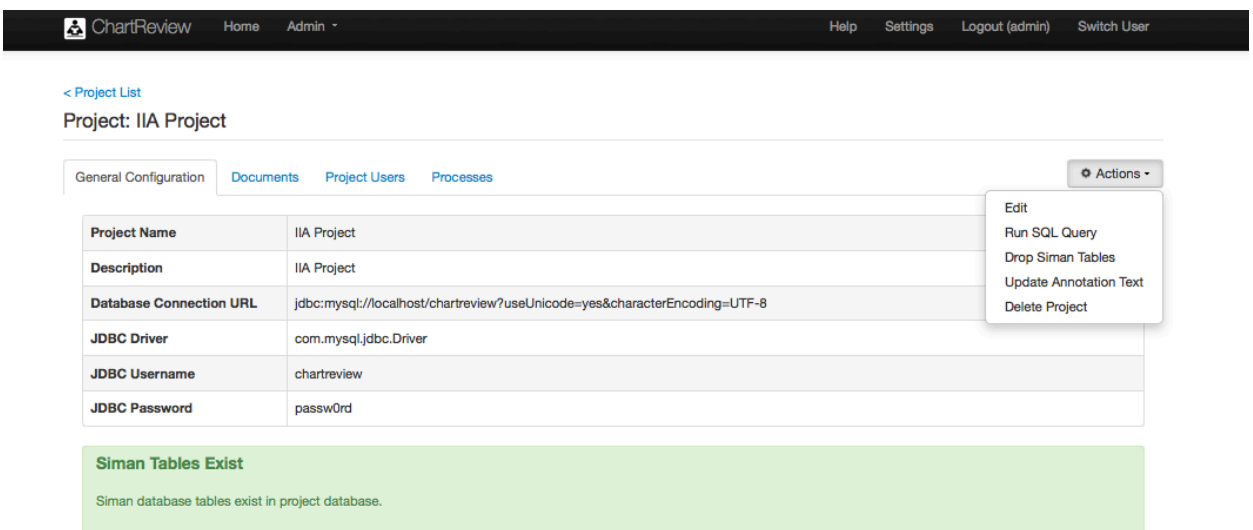


Table 13: Admin – Project – Show – General Configuration

Item/Action	Description/Result
Project Name	The name of the project.
Description	A brief description of the project.
Database Connection	This is the jdbc connection string to the project database (i.e.

URL	jdbc:mysql://localhost/chartreview?useUnicode=yes&characterEncoding=UTF-8).
JDBC Driver	The jdbc driver used to connect to the project database (i.e. com.mysql.jdbc.Driver).
JDBC Username	Username to log into the project database.
JDBC Password	Password to log into the project database.
Edit	Takes you to the pages to edit the specified project.
Run SQL Query	Takes you to the page that allows you to run an SQL query against the project database.
Drop Siman Tables	Drops the Siman tables from the project database.
Update Annotation Text	Annotations save a copy of the text that was spanned with than annotation swipe, as well as the start and end offsets of that span. This utility function refreshes the copy of the spanned text in all annotations in the project by querying the original documents with the annotation span anew. This action may be used if annotations are imported that do not save spanned text, for example.
Delete Project	Deletes the entire project!
Siman Tables Exist	Siman tables exist in the project database – no action required.
Siman Tables Do Not Exist	Chart Review requires that Siman tables exist in the project database. Siman tables hold annotation information and are a standard integration framework for sharing annotations with other systems like UIMA NLP Pipelines and CHEX annotation validation.
Create Siman Tables	Creates the Siman tables in the project database.

Figure 15. Admin – Project – Show – Documents

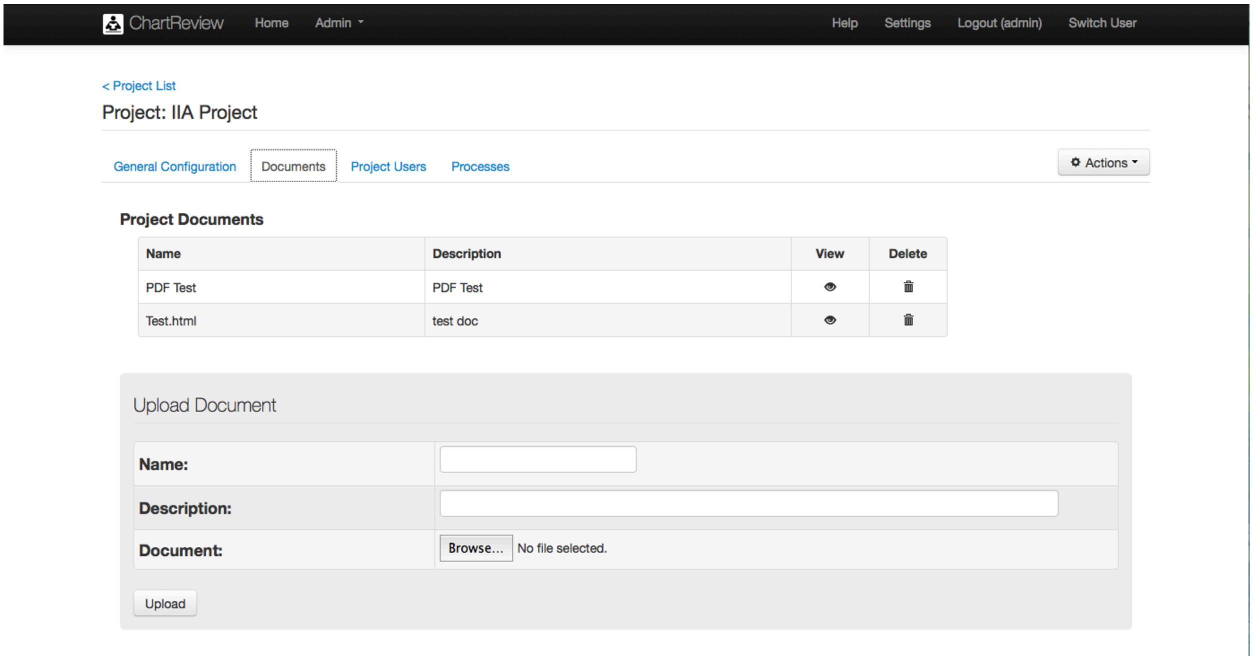


Table 14: Admin – Project – Show – Documents

Item/Action	Description/Result
Name	The name of the documents that are associated with the project. Project documents can be included in an annotation workflow process task to allow an annotator to better understand the annotation task given him.
Description	A brief description of the project document.
View	Opens a new browser tab to display the selected project document.
Delete	Deletes the project document from the project database.
Upload Document	
Name	Name of the document to upload to the project.
Description	A brief description of the document that will be displayed during Chart Review to an annotator if

	this document is included as a task description.
Document	The document to upload.
Browse	Browse the local browser file system for a document to upload.
Upload	Uploads the document to the project database.

Figure 16. Admin – Project – Show – Project Users

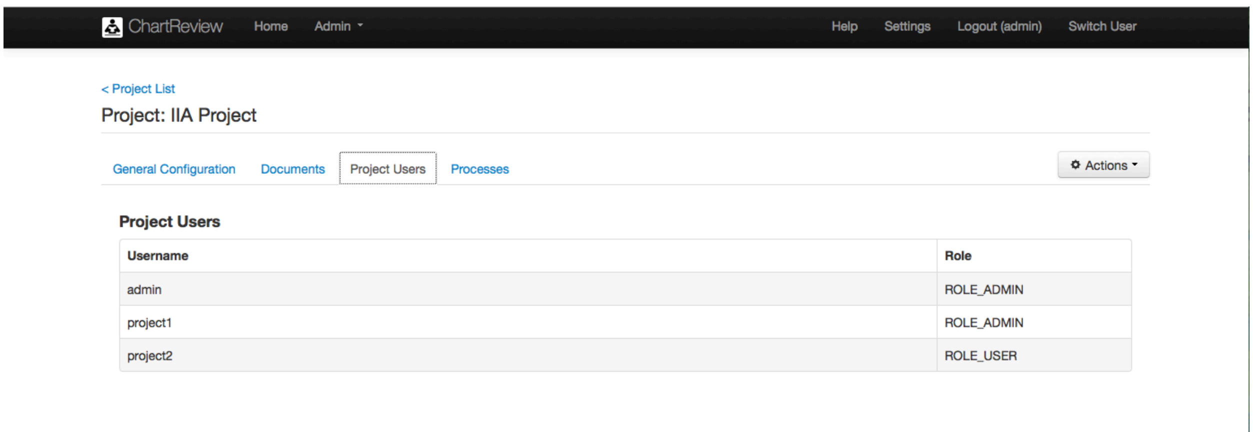


Table 15: Admin – Project – Show – Project Users

Item/Action	Description/Result
Username	The name of a user that has a role in this project.
Role	The role of a user on this project (i.e. ROLE_ADMIN, ROLE_USER).

Figure 17. Admin – Project – Show – Processes

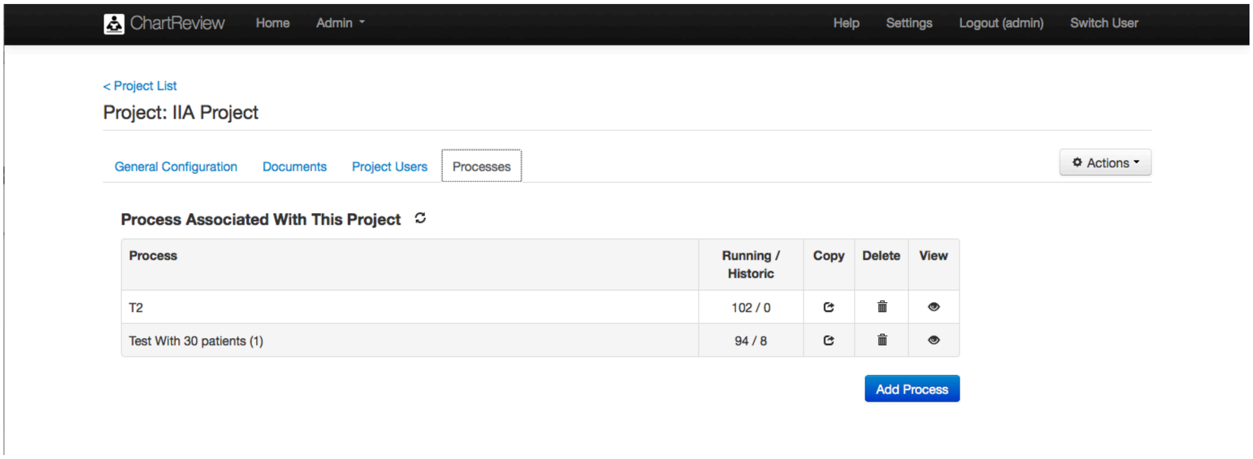


Table 16: Admin – Project – Show – Project Users

Item/Action	Description/Result
Refresh	Refreshes the list of process of this project.
Process	The name of a user that has a role in this project.
Running/Historic	The role of a user on this project (i.e. ROLE_ADMIN, ROLE_USER).
Copy	Copies the specified process and takes you to the pages to edit that process.
Delete	Deletes the process!
View	Takes you to the pages to view the specified process.
Add Process	Adds a process to the project and takes you to the pages to edit that process.

Figure 18. Admin – Project – Edit – General Configuration

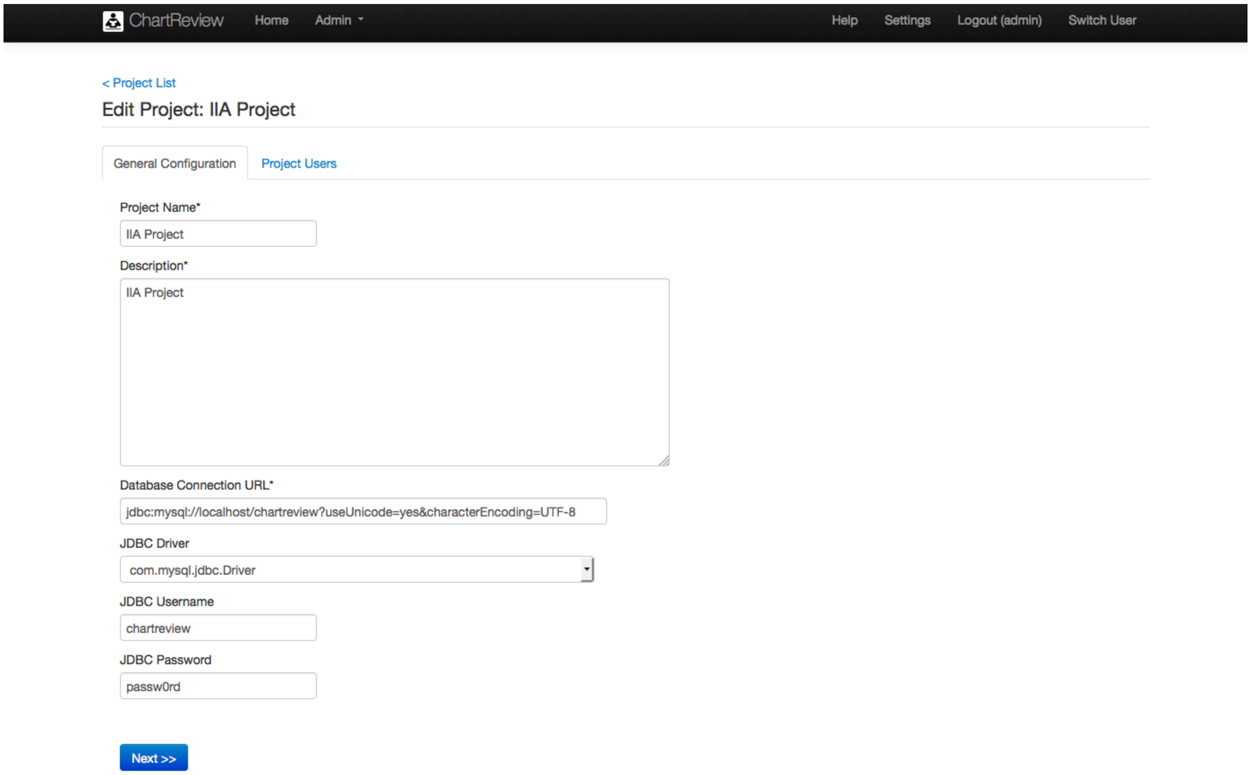


Table 17: Admin – Project – Edit – General Configuration

Item/Action	Description/Result
Project Name	The name of the project.
Description	A brief description of the project.
Database Connection URL	This is the jdbc connection string to the project database (i.e. jdbc:mysql://localhost/chartreview?useUnicode=yes&characterEncoding=UTF-8).
JDBC Driver	The jdbc driver used to connect to the project database (i.e. com.mysql.jdbc.Driver).
JDBC Username	Username to log into the project database.
JDBC Password	Password to log into the project database.
Next	Takes you to the Project Users tab in the project editor.

Figure 19. Admin – Project – Edit - Project Users

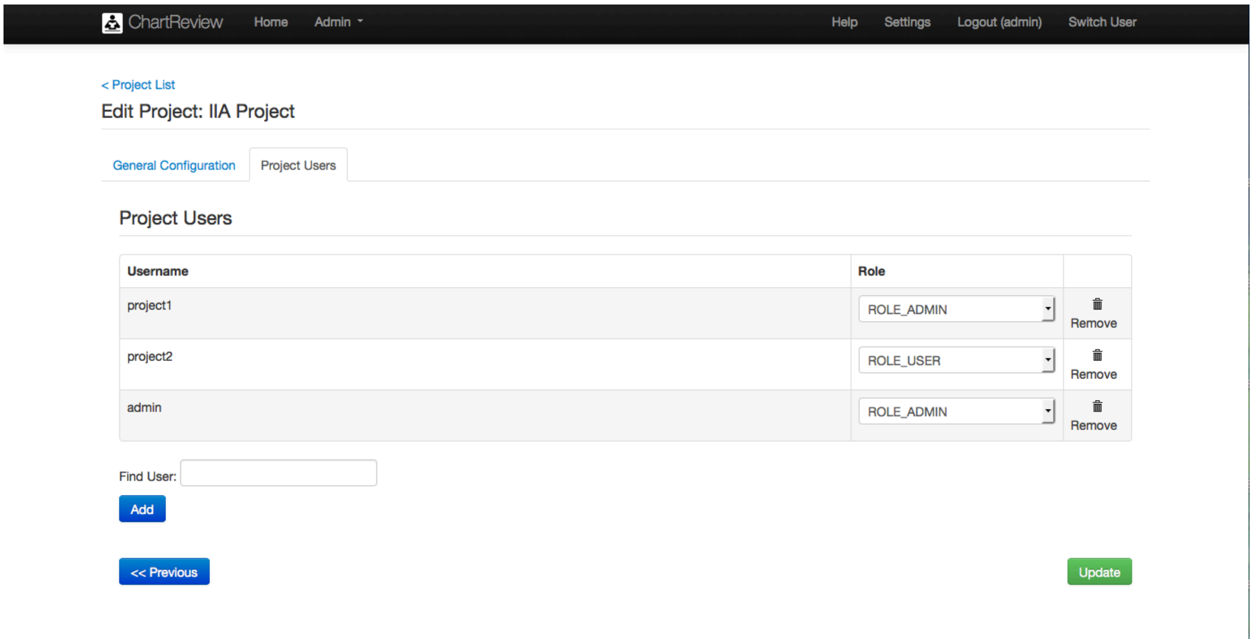


Table 18: Admin – Project – Edit – Project Users

Item/Action	Description/Result
Username	The name of a user that has a role in this project.
Role	The role of a user on this project (i.e. ROLE_ADMIN, ROLE_USER).
Remove	Removes the user from the project.
Find User	Name of the user to find in the system.
Add	Adds username in the text field Find User as a user in the project. ⚠ Note: If the user is not a valid system user, an error message will be displayed.
Previous	Takes you to the General Configuration tab.
Update	Updates the project with the edited project values.

Figure 20. Admin – Project – Add Process – Step 1 – Choose the Process to Add

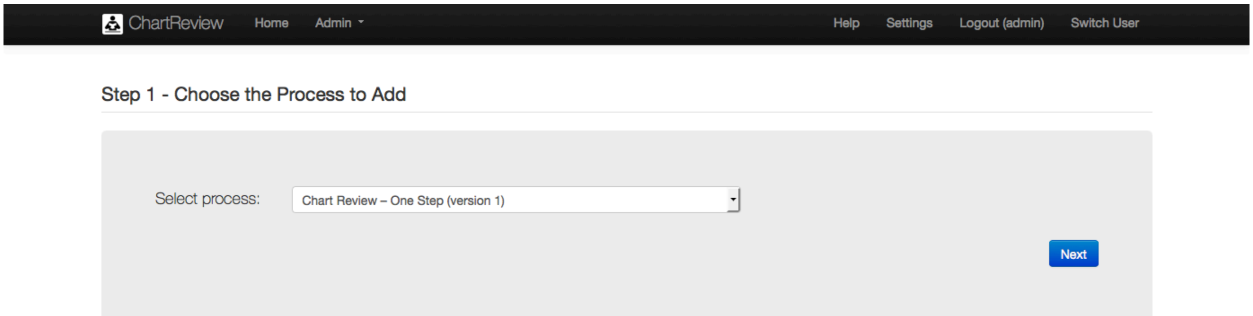


Table 19: Admin – Project – Add Process – Step 1 – Choose the Process to Add

Item/Action	Description/Result
Select process	The process template type that the process will be modeled from. For example, a single step process or a multi-step process, etc. Process templates can be uploaded in the Admin -> Process menu.
Next	Takes you to the next step in the process creation wizard.

Figure 21. Admin – Project – Add Process – Step 2 – Process Parameters

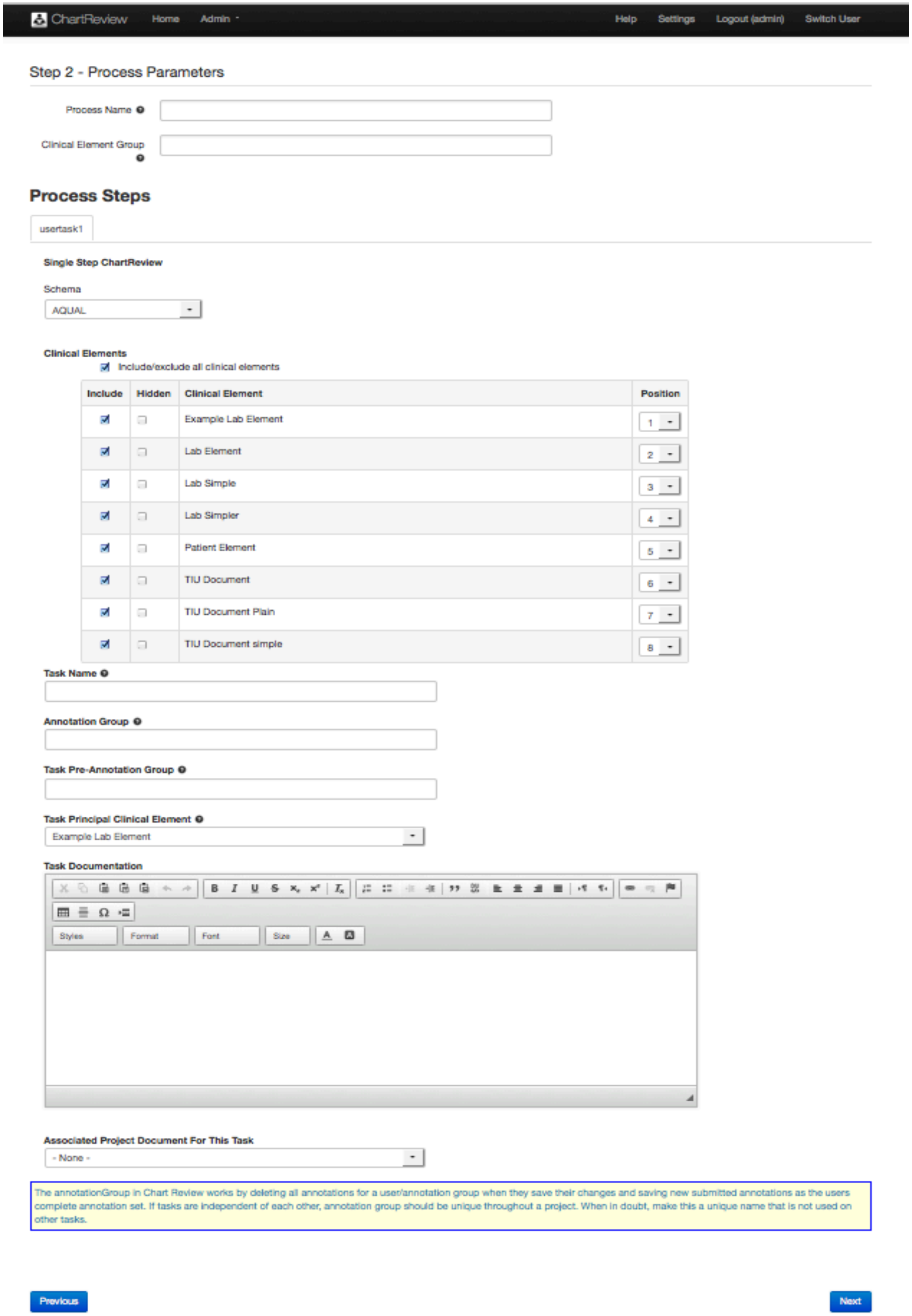


Table 20: Admin – Project – Add Process – Step 2 – Process Parameters

Item/Action	Description/Result
Process Name	The name of the process that is presented in Chart Review
Clinical Element Group	This is an optional grouping that will keep all clinical elements grouped under a specified group. Generally this should be left blank. This essentially allows for multiple copies of the same clinical element "document". Annotations created on one copy of a clinical element could never be seen on another copy of the clinical element, in, for example, a subsequent "downstream" process.
Process Steps	There will be one tab for each step (task) that is defined in the chosen process type workflow.
Schema	The annotation schema that an annotator will use during Chart Review to perform the annotation task required in this step of the annotation process workflow. Schemas are defined through the Admin -> Schema menu item.
Clinical Elements	The clinical elements that will be displayed as context to the principal clinical element displayed in Chart Review. The principal clinical element is the clinical element that the task is focused on, for example a patient is a common principal clinical element. Along with the principal clinical element, an annotator may need to see other contextual clinical information that would support the annotation of the principal clinical element. For example, to classify a patient for a given study, an annotator may need to see clinical notes, lab values, and radiology reports, but he may not need to see medication or problem lists. Note that in Chart Review, context clinical elements may be annotated as well as the principal.
Include/exclude all clinical elements	A convenience toggle for including/excluding all listed clinical elements.
Include	If checked, the specified clinical element will be

	available to be displayed in Chart Review when an annotator performs this task.
Hidden	If checked, the specified clinical element will not be displayed automatically when an annotator initially retrieves this task.
Clinical Element	Name of the clinical element.
Position	The order in which the specified clinical element view will appear in Chart Review. For example, a clinical element with position 1 will appear in the top priority visual position in the application browser window layout. Positions do not have to be sequential: included clinical elements with positions of 1, 3, and 5 will be seen in the same order as if they had positions 1, 2, and 3.
Task Name	The name of the task that is presented in Chart Review
Annotation Group	Annotations created for this task will be stored with this annotation group. Annotations may be included in downstream process tasks as pre-annotations by specifying this annotation group as the Task Pre-Annotation Group of the subsequent process task.
Task Pre-Annotation Group	The annotation group to load as pre-annotations to this task. If there are multiple pre-annotation groups, separate them with a SEMI-COLON AND NO SPACES. For example: group1;group2;group3.
Task Principal Clinical Element	Usually this is the patient clinical element. More generally, this is the clinical element for which a task is created. The purpose of the task is to present for annotation this clinical element. All other clinical element information is contextual to performing the task on this clinical element.
Task Documentation	A description of what needs to be done to accomplish this task. The target audience is an annotator. This description is displayed in the Chart Review task panel. If this description is long or needs graphics, consider uploading a document

	to the project (Admin -> Project -> Documents) and selecting that document in Associated Project Document For This Task below.
Associated Project Document For This Task	A project document that describes what needs to be done to accomplish this task. The target audience is an annotator.
Previous	Takes you to the previous page in the Create Process wizard.
Next	Takes you to the next step in the Create Process wizard.

Figure 22. Admin – Project – Add Process – Step 3 – Users and Clinical Elements In This Process

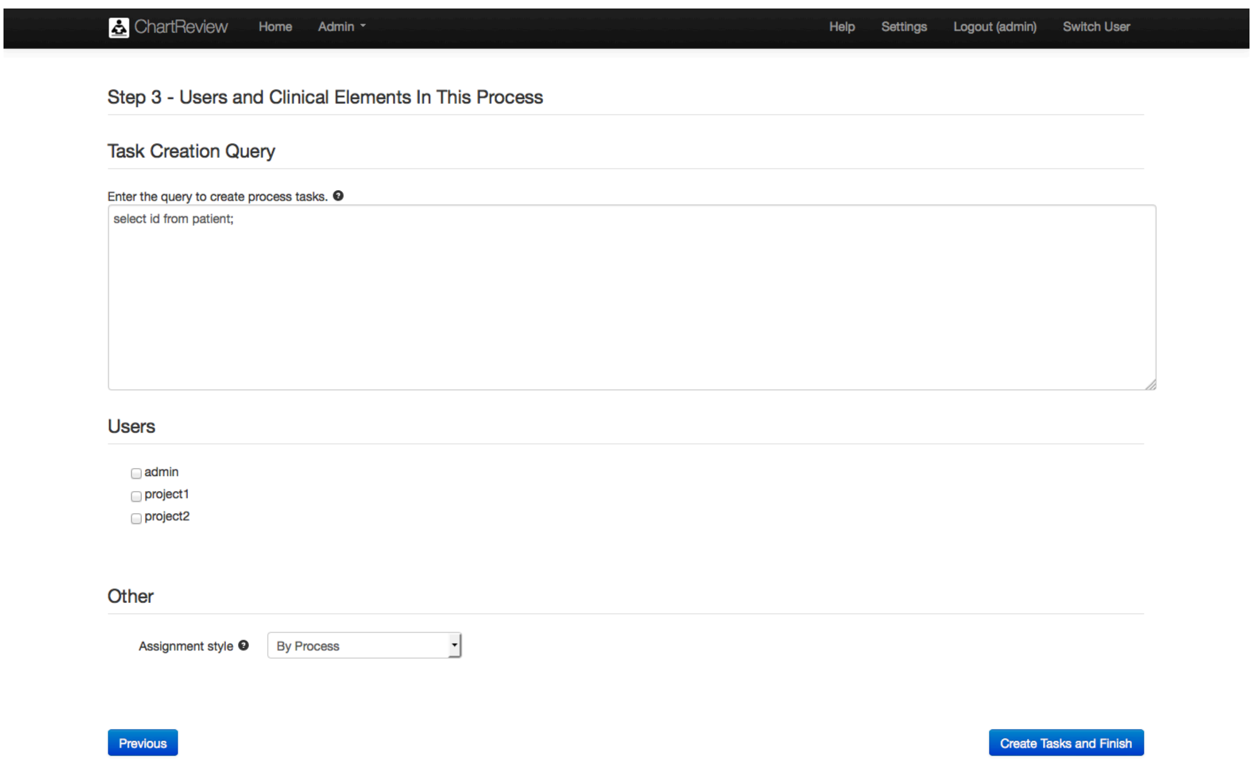


Table 21: Admin – Project – Add Process – Step 3 – Users and Clinical Elements In This Process

Item/Action	Description/Result

Task Creation Query	Query to select a list of principal clinical element ids (i.e. patient ids). A task is created for each clinical element id returned.
Users	Select all users that could perform this task. Users may be added to a project in Admin -> Project.
Other	
Assignment Style	When an annotator gets a new assignment in Chart Review, an assignment style of BY PROCESS dedicates all tasks in a process to the annotator. That annotator must complete all tasks in the assigned process. An assignment style of BY TASK dedicates only one task to the annotator. Other tasks in the process may be completed by other annotators, or by this annotator, whoever is available first.
Previous	Takes you to the previous page of the Create Process wizard.
Create Tasks and Finish	Saves the process information and creates all tasks for the process. These tasks are saved in a queue waiting for an annotator to get a new assignment in Chart Review.

Figure 23. Admin – Project – Run SQL Query

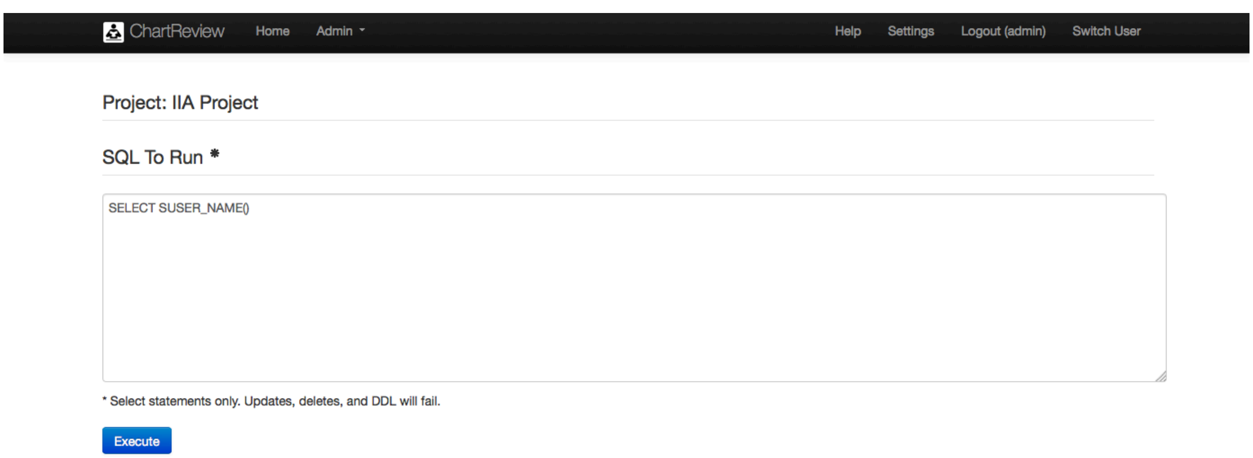


Table 22: Admin – Project – Run SQL Query

Item/Action	Description/Result
SQL To Run	Any select statement to run against the project database. This is a convenience feature, allowing discovery of project database data that may be needed for project definition, management, or maintenance. Note: Updates and deletes and DDL with fail.
Execute	Execute the query

2.4 Reports (User/Admin)

The Reports item in the Admin drop down menu takes you to pages that allow perusal of analytical reports about various aspects of any of your projects, including task completion, annotations made, inter-annotator agreement, etc.

Figure 24. Admin – Chose Project and Processes For Reports

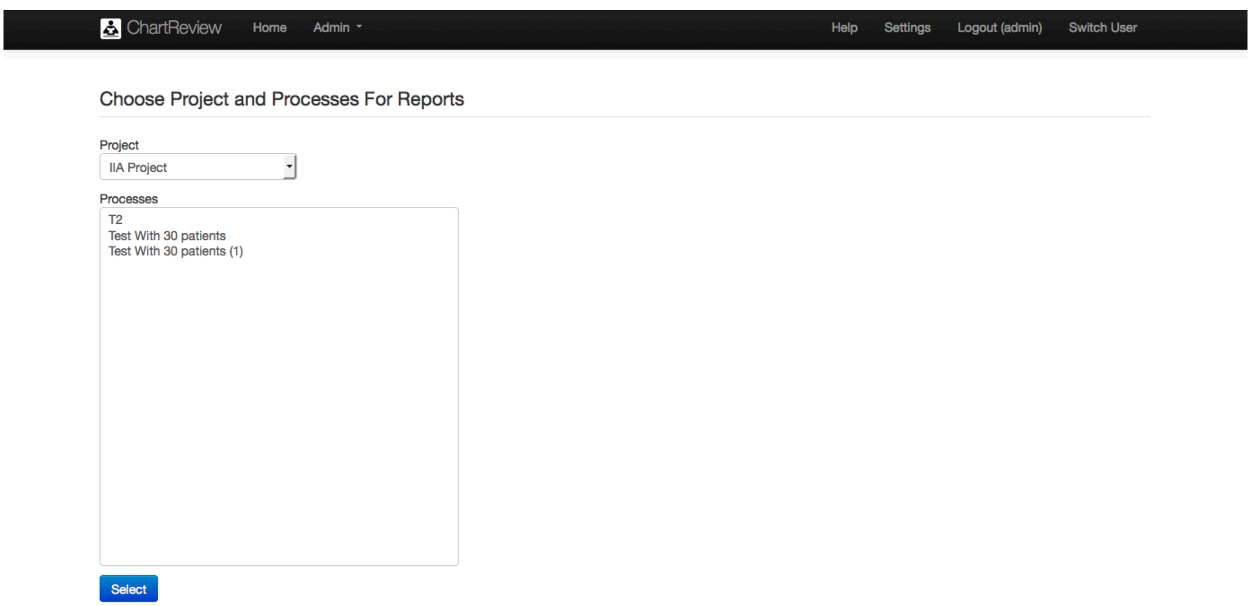


Table 23: Admin – Chose Project and Processes For Reports

Item/Action	Description/Result

Project	The project to be reported on.
Processes	The processes of the project to be reported on.
Select	Sets the project and processes for which reports from the report page will be given.

Figure 25. Admin – Reports

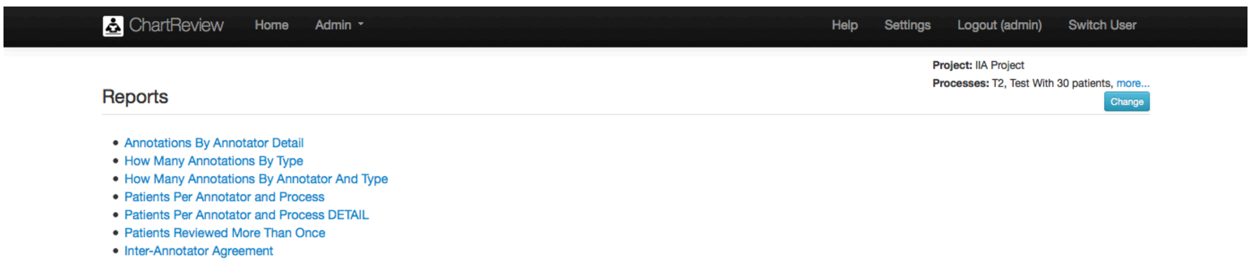
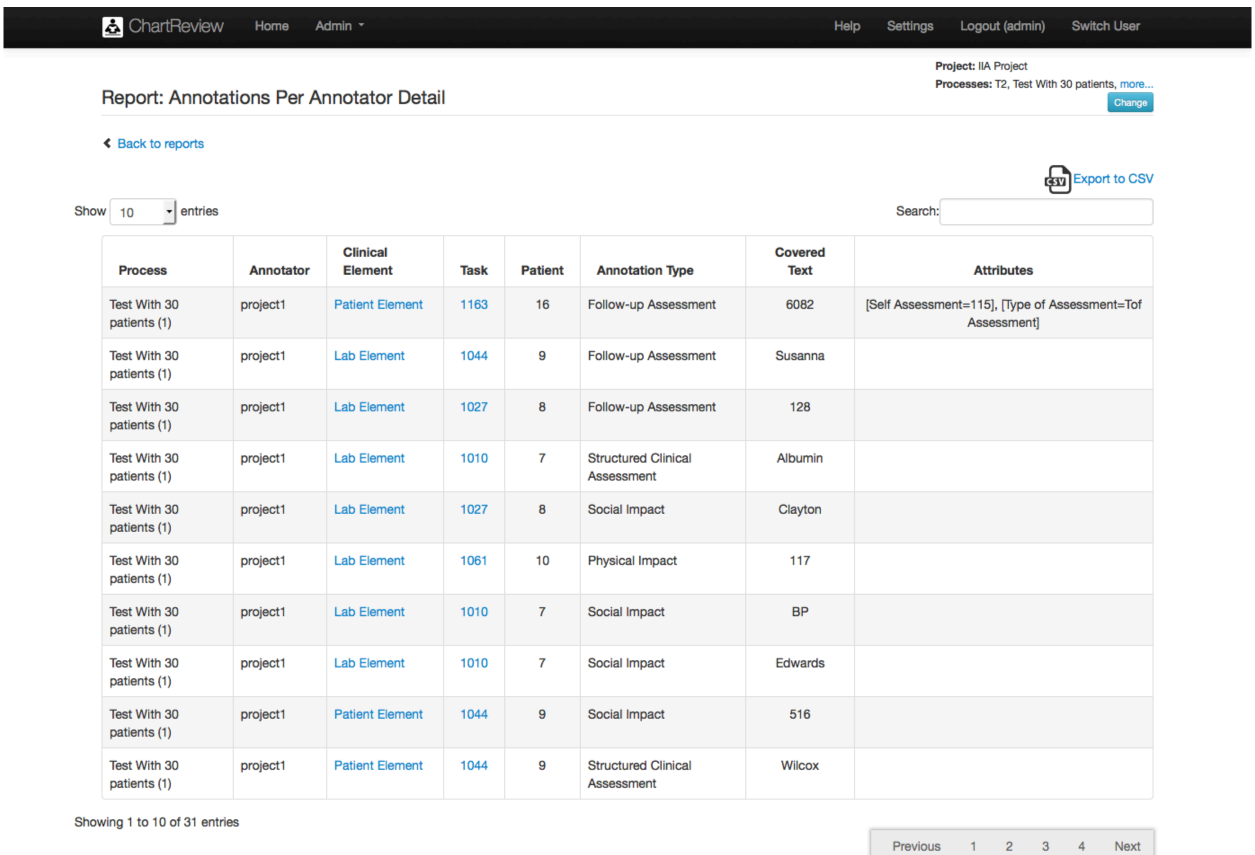


Table 24: Admin – Reports

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
How Many Annotations By Type	A report of how many annotations were created for each classification found in the process task schemas.
How Many Annotations By Annotator And Type	A report of how many annotations were created for each classification found in the process task schemas, listed by which annotator created the annotations.
Patients Per Annotator and Process	A report of how many patients were annotated by each annotator for each process.

Patients Per Annotator and Process Detail	A report of which principal clinical elements (i.e. patients) that were annotated by which annotators for the process tasks.
Patients Reviewed by More Than One Annotator	A report of how many times each principal clinical element (i.e. patient) has been reviewed by an annotator.
Inter-Annotator Agreement	A report of inter annotator agreement using a Fleiss' kappa by principal clinical element (i.e. patient), by classification, by annotator.

Figure 26. Admin – Report – Annotations Per Annotator Detail



Process	Annotator	Clinical Element	Task	Patient	Annotation Type	Covered Text	Attributes
Test With 30 patients (1)	project1	Patient Element	1163	16	Follow-up Assessment	6082	[Self Assessment=115], [Type of Assessment=Tof Assessment]
Test With 30 patients (1)	project1	Lab Element	1044	9	Follow-up Assessment	Susanna	
Test With 30 patients (1)	project1	Lab Element	1027	8	Follow-up Assessment	128	
Test With 30 patients (1)	project1	Lab Element	1010	7	Structured Clinical Assessment	Albumin	
Test With 30 patients (1)	project1	Lab Element	1027	8	Social Impact	Clayton	
Test With 30 patients (1)	project1	Lab Element	1061	10	Physical Impact	117	
Test With 30 patients (1)	project1	Lab Element	1010	7	Social Impact	BP	
Test With 30 patients (1)	project1	Lab Element	1010	7	Social Impact	Edwards	
Test With 30 patients (1)	project1	Patient Element	1044	9	Social Impact	516	
Test With 30 patients (1)	project1	Patient Element	1044	9	Structured Clinical Assessment	Wilcox	

Table 25: Admin – Report – Annotations Per Annotator Detail

Item/Action	Description/Result

More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the columns of the table.
Process	The process for which the report was generated.
Annotator	The annotator that created the annotation.
Clinical Element	The name of the clinical element configuration type of the clinical element of the annotation. Clicking on this name allows you to view the content of the clinical element that was annotated.
Task	The id of the task the annotation was created for. Clicking on this id takes you into Chart Review to review or change that completed task.
Patient	The principal clinical element (i.e patient) that was annotated.
Annotation Type	The classification from the project task annotation schemas of the annotation.
Covered Text	The clinical element content text that was highlighted by the annotation (if any).

Attributes	A list of the annotation features (name/value pairs).
Showing x to y of N entries	The current location of the page within the data.
Previous…Page Numbers…Next	Move between pages of the report.

Figure 27. Admin – Report – Annotations Per Annotator Detail – Clinical Element

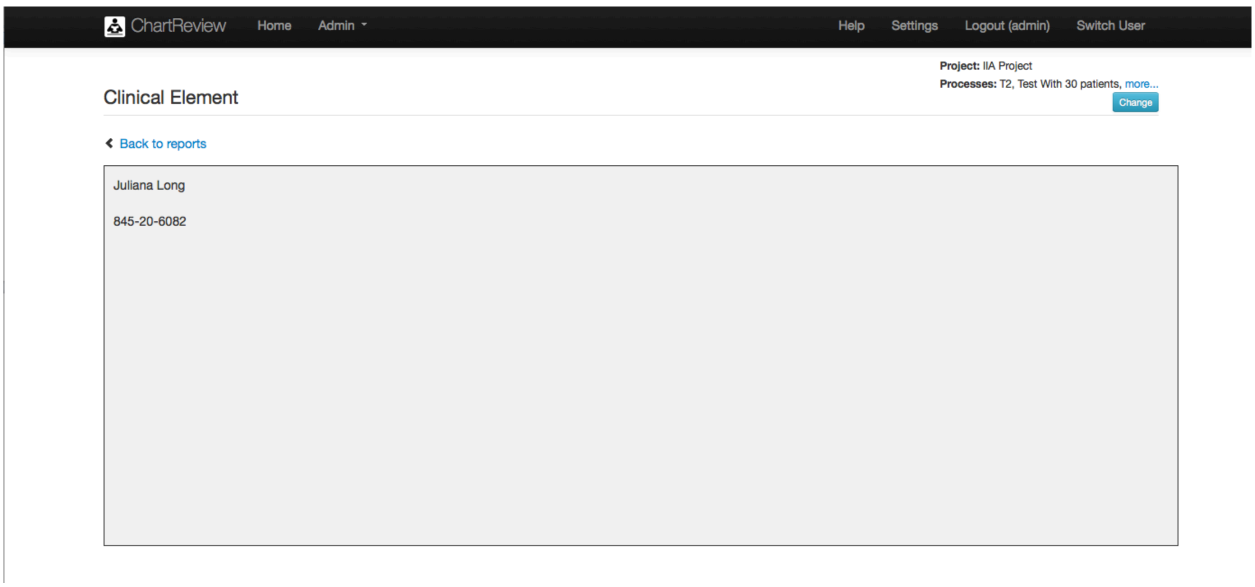


Table 26: Admin – Annotations Per Annotator Detail – Clinical Element

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Clinical Element Content	The content of the clinical element.

Figure 28. Admin – Report – How Many Annotations By Type

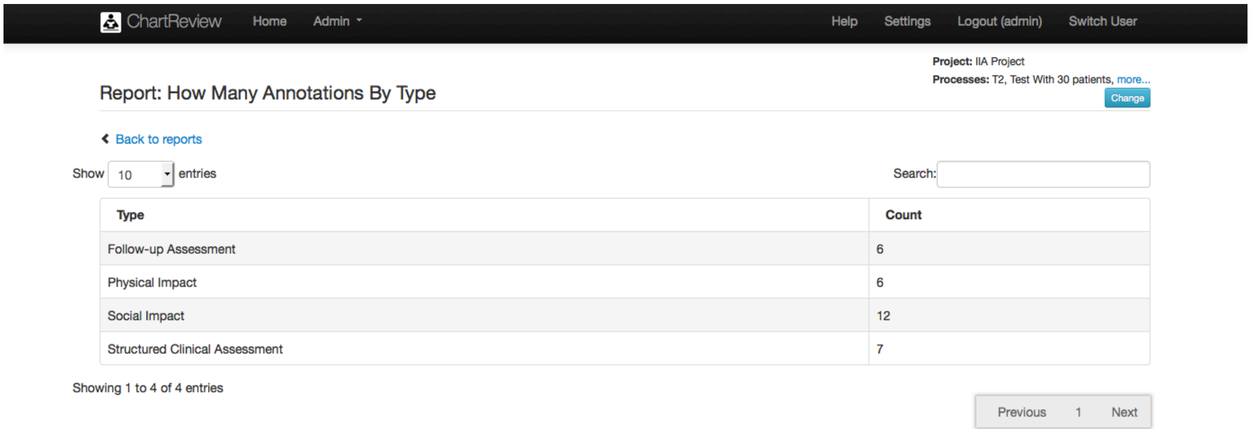


Table 27: Admin – Report – How Many Annotations By Type

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the columns of the table.
Type	The classification type of the annotations counted.
Count	The number of annotations of the given classification type.
Showing x to y of N entries	The current location of the page within the data.

Previous…Page Numbers…Next	Move between pages of the report.

Figure 29. Admin – Report – How Many Annotations By Annotator And Type

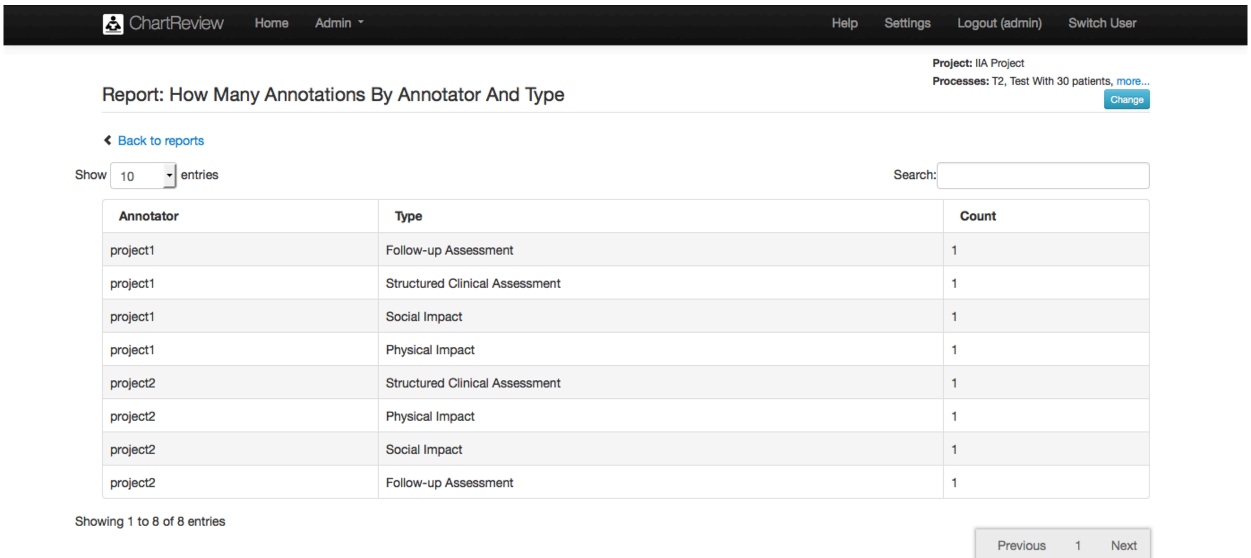


Table 28: Admin – Report – How Many Annotations By Annotator And Type

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the

	columns of the table.
Annotator	The annotator that created the annotations represented in the count by type.
Type	The classification type of the annotations counted.
Count	The number of annotations of the given classification type.
Showing x to y of N entries	The current location of the page within the data.
Previous…Page Numbers…Next	Move between pages of the report.

Figure 30. Admin – Report – Patients Per Annotator and Process

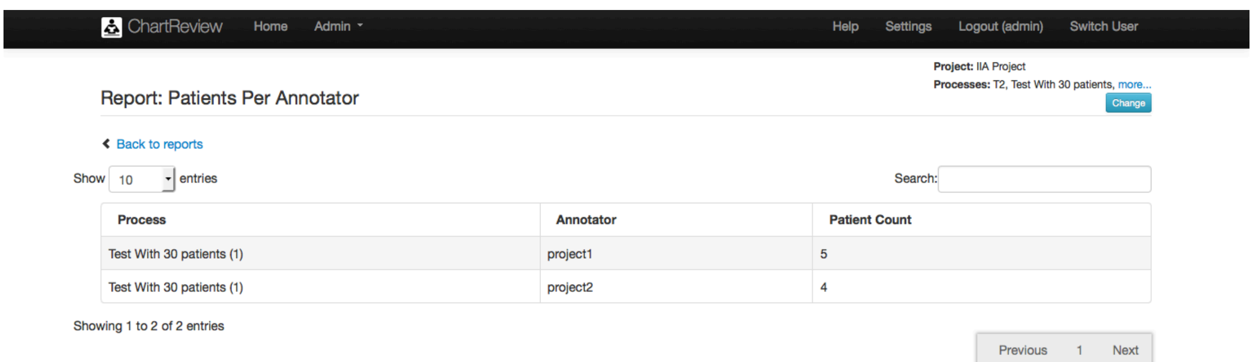


Table 29: Admin – Report – Patients Per Annotator and Process

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a

	CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the columns of the table.
Process	The process from which the patient count by annotator is found.
Annotator	The annotator that created the annotations represented in the count.
Patient Count	The number of annotations created by the given annotator for the given process.
Showing x to y of N entries	The current location of the page within the data.
Previous…Page Numbers…Next	Move between pages of the report.

Figure 31. Admin – Report – Patients Per Annotator And Process DETAIL

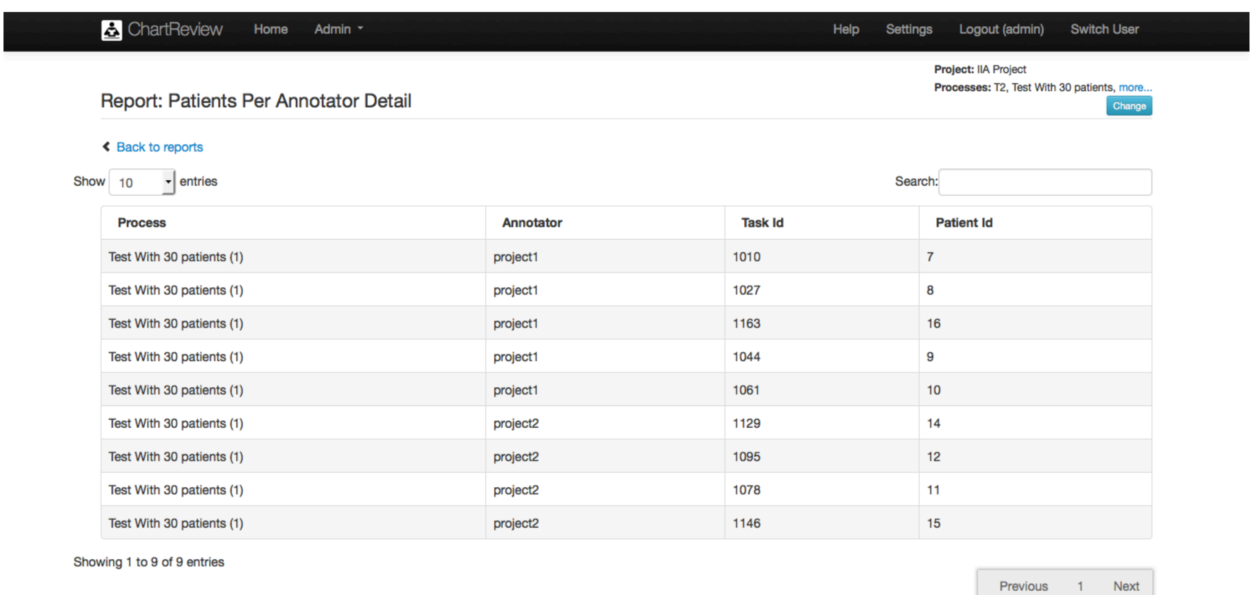


Table 30: Admin – Report – Patients Per Annotator and Process DETAIL

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the columns of the table.
Process	The process from which the principal clinical element (i.e. patient) annotation task was performed.
Annotator	The annotator that performed the principal clinical element (i.e. patient) annotation task.
Task Id	The id of the annotation task from which the principal clinical element (i.e. patient) annotation task was performed.
Patient Id	The id of the principal clinical element (i.e. patient) on which the annotation task was performed.
Showing x to y of N entries	The current location of the page within the data.
Previous…Page Numbers…Next	Move between pages of the report.

Figure 32. Admin – Report – Patients Reviewed More Than Once

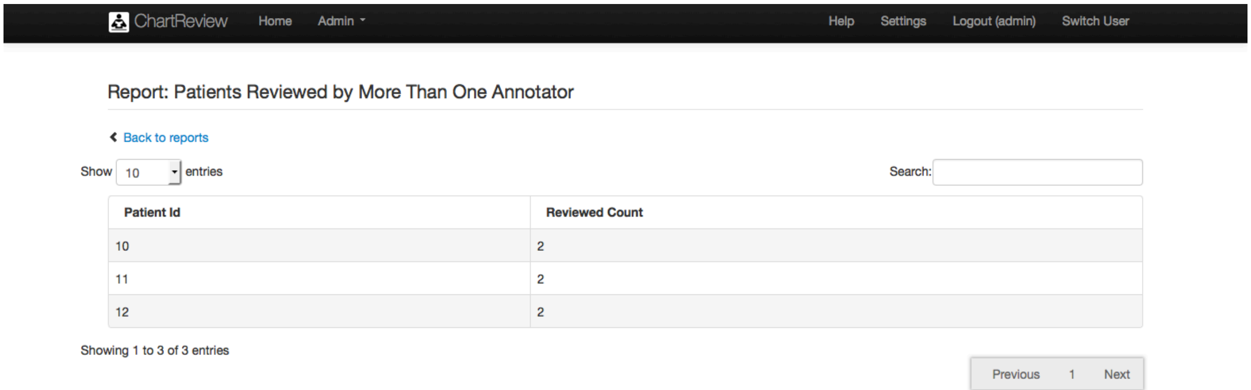


Table 31: Admin – Report – Patients Reviewed More Than Once

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
Export to CSV	Opens the report in Microsoft Excel or saves a CSV to the local file system.
Show N entries	The number of rows to display per page.
Search	Filters the list by the given string (word/partial word). Note: The string can be found in any of the columns of the table.
Patient Id	The principal clinical element (i.e. patient) that was reviewed more than once.
Reviewed Count	The count of times that the principal clinical element (i.e. patient) was reviewed.

Showing x to y of N entries	The current location of the page within the data.
Previous…Page Numbers…Next	Move between pages of the report.

Figure 33. Admin – Report – Inter-Annotator Agreement – Original Report

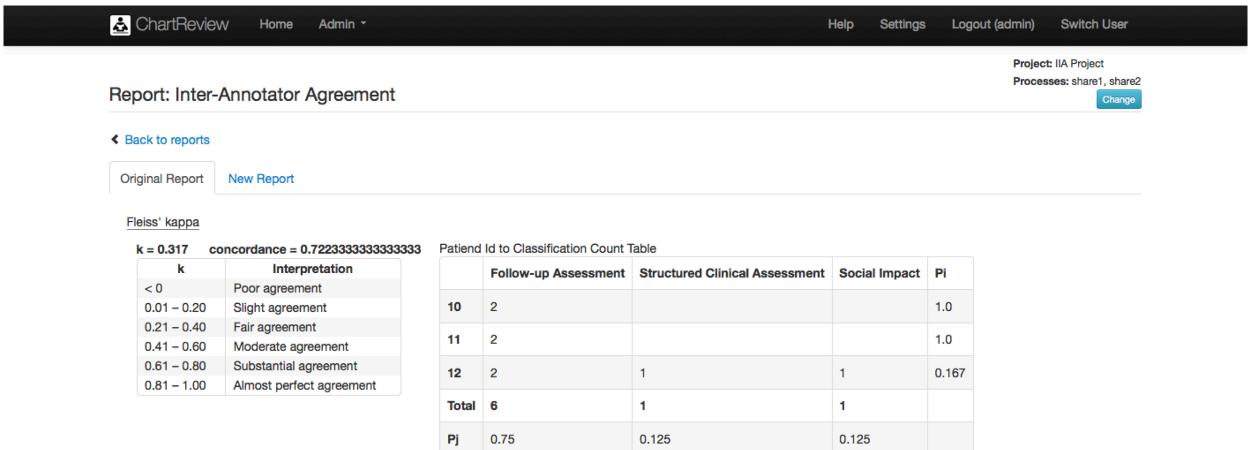


Table 32: Admin – Report – Inter-Annotator Agreement – Original Report

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
k (Fleiss' kappa)	A statistica measure for assessing the reliability of agreement between a fixed number of annotators when assigning categories to a number of patients. See: en.wikipedia.org/wiki/Fleiss'_kappa
concordence	The average of the Pi column.
Left column values	The principal clinical element ids (i.e. patient).

Top row values	Annotation schema categories of annotations.
Cell	Number of annotators annotating an annotation schema category.

Figure 34. Admin – Report – Inter-Annotator Agreement – New Report

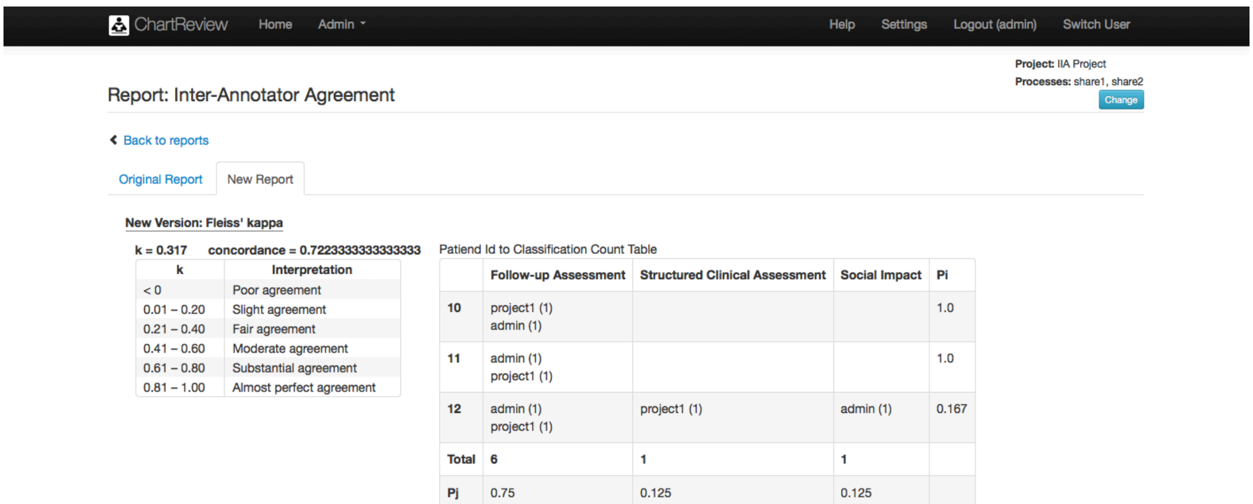


Table 33: Admin – Report – Inter-Annotator Agreement – New Report

Item/Action	Description/Result
More…	Takes you to a popup displaying the project name and a list of all processes in that project.
Change	Takes you back to the Choose Project and Processes For Reports page to pick another project and processes to report on.
Back to reports	Takes you back to the list of reports available.
k (Fleiss' kappa)	A statistica measure for assessing the reliability of agreement between a fixed number of annotators when assigning categories to a number of patients. See: en.wikipedia.org/wiki/Fleiss'_kappa

concordence	The average of the Pi column.
Left column values	The principal clinical element ids (i.e. patient).
Top row values	Annotation schema categories of annotations.
Cell	Number of annotators annotating an annotation schema category listed by annotator.

2.5 Schemas (User/Admin)

The Schemas item in the Admin drop down menu takes you to the pages that allow perusal and definition of a library of annotation schemas that is shared by all users and all projects. These annotation schemas define the classifications, and class attributes that will be used to perform the work of an annotation task.

Chart Review annotation schemas provide the following basic entities:

- Classifications
- Attributes (text, numeric, date, option list) – can be reused on classifications

Figure 35. Admin – Schema List

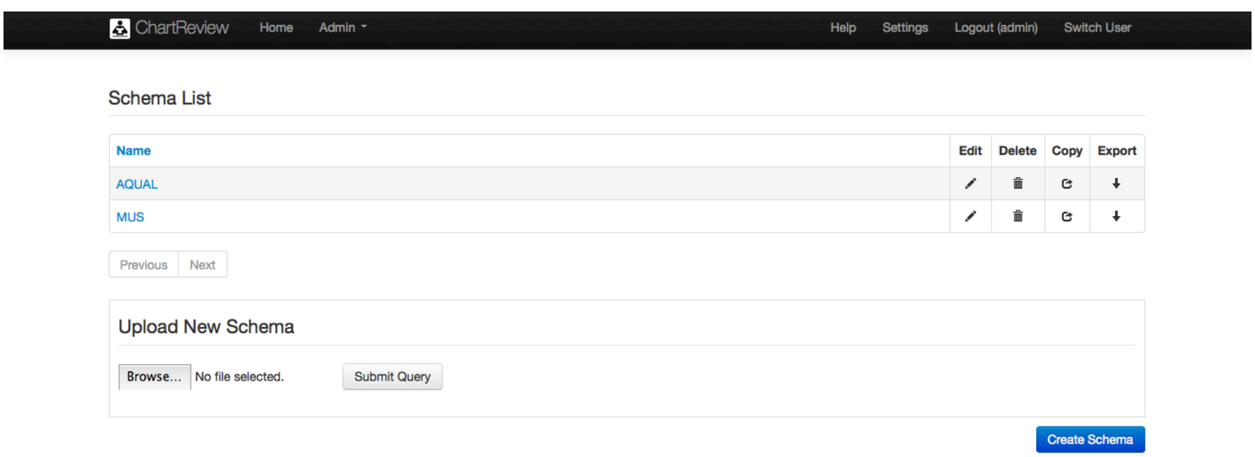


Table 34: Admin – Schema List

Item/Action	Description/Result

Name Column	Sorts the schema list by schema name.
Name link	Takes you to the pages that edit the specified schema.
Name	The name of the schema.
Edit	Takes you to pages to edit the specified schema.
Delete	Deletes the specified schema!
Copy	Copes the specified schema and takes you to the pages to edit it.
Export	Opens a new tab in the browser and displays the specified schema in XML format. This format can be uploaded in another project or another Chart Review system deployment.
Previous…123…Next	Standard list paging mechanism.
Create Schema	Creates a schema and takes you to the pages to edit it.
Upload New Schema	Uploads a new schema from XML file to the database.
Browse	Brows the local browser file system for a schema file to upload.
Submit Query	Uploads the schema file.

Figure 36. Admin – Schema – General Configuration

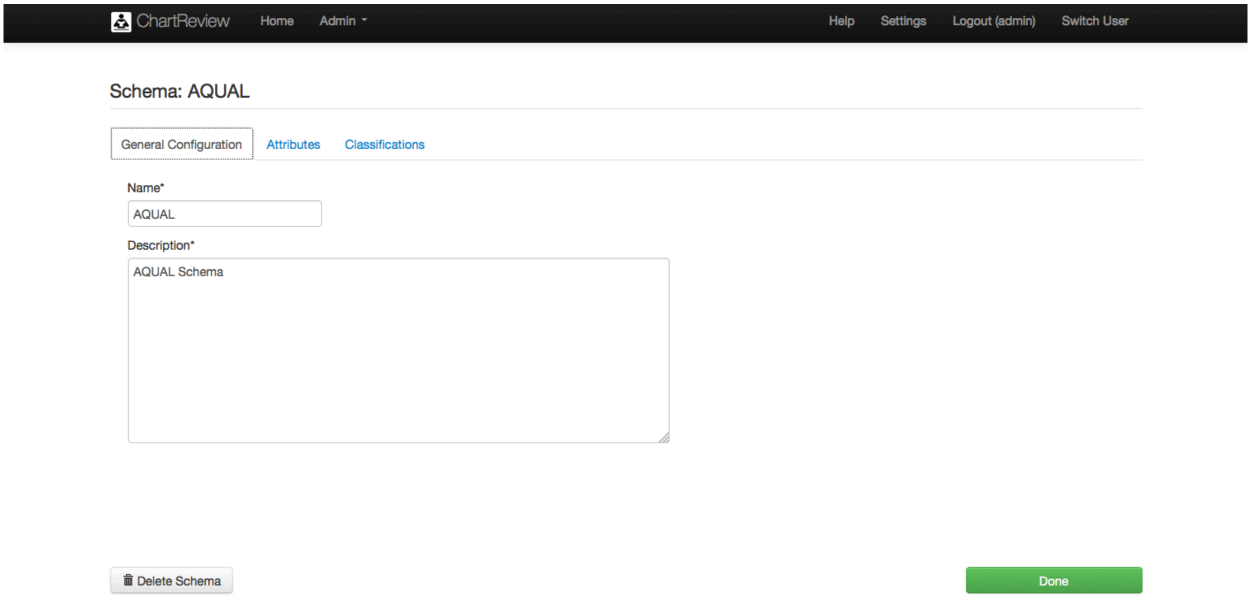


Table 35: Admin – Schema – General Configuration

Item/Action	Description/Result
Name	The name of the schema.
Description	A brief description of the schema.
Delete Schema	Deletes the schema!
Done	Saves the changes to the schema and takes you to the Schema List page.

Figure 37. Admin – Schema – Attributes

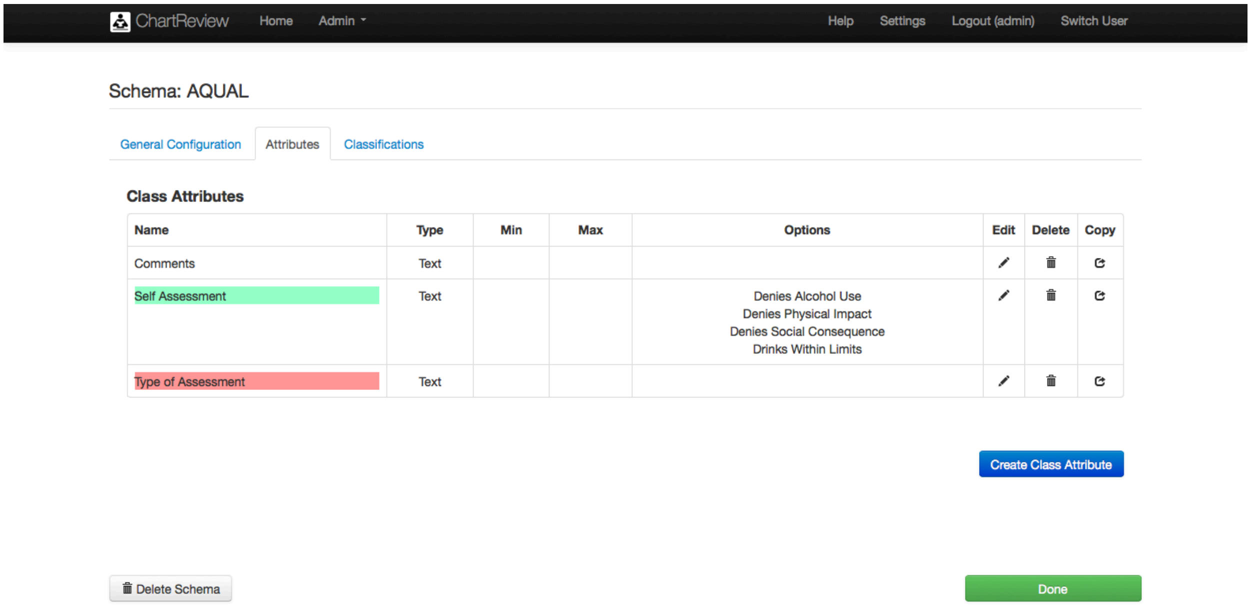


Table 36: Admin – Schema – Attributes

Item/Action	Description/Result
Name	The name of the class attributes.
Type	The type of class attribute (i.e. Text/Numeric/Date/Options).
Min	The minimum valid numeric or date value.
Max	The maximum valid numeric or date value.
Options	The list of options for an option type class attribute.
Edit	Takes you to pages to edit the specified class attribute.
Delete	Deletes the specified class attribute!
Copy	Copes the specified class attribute and takes you to the pages to edit it.
Create Class Attribute	Creates a new class attribute and takes you to the

	pages to edit it.
Delete Schema	Deletes the schema!
Done	Saves the changes to the schema and takes you to the Schema List page.

Figure 38. Admin – Schema – Attribute – Create/Edit

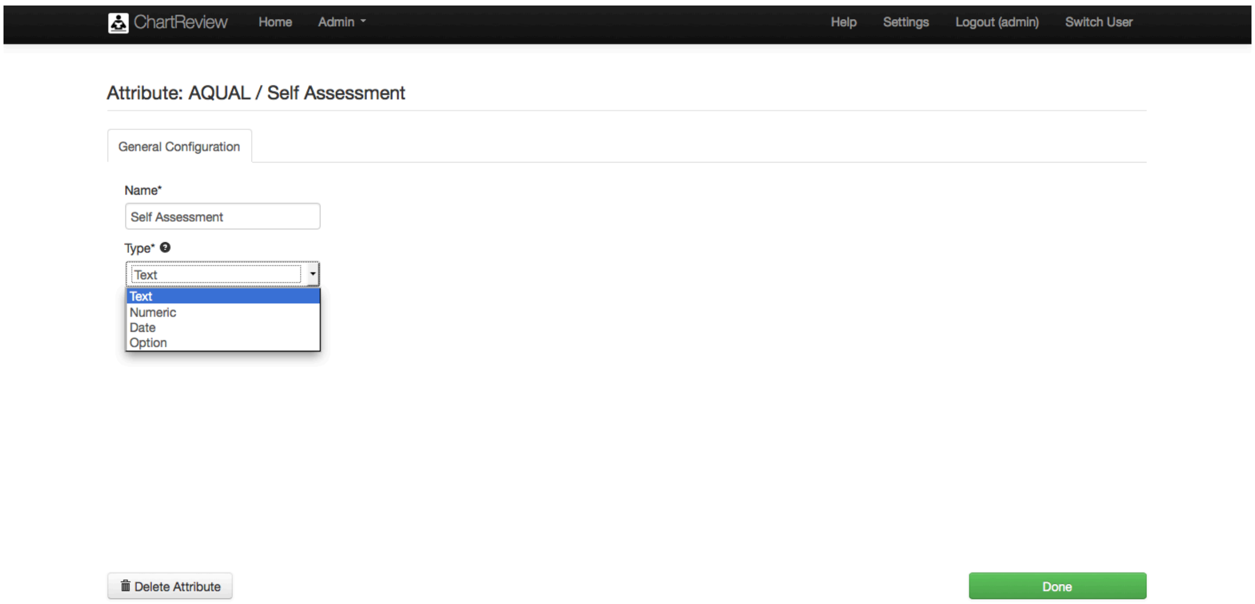


Table 37: Admin – Schema – Attribute – Create/Edit

Item/Action	Description/Result
Name	The name of the class attribute.
Type	The type of the class attribute (i.e. Text/Numeric/Date/Option). An option attribute is presents a list of valid options from which to choose during Chart Review).
Delete Attribute	Deletes the attribute!
Done	Saves the changes to the attribute and takes you to the Create/Edit Schema page.

Figure 39. Admin – Schema – Attribute – Create/Edit - Numeric

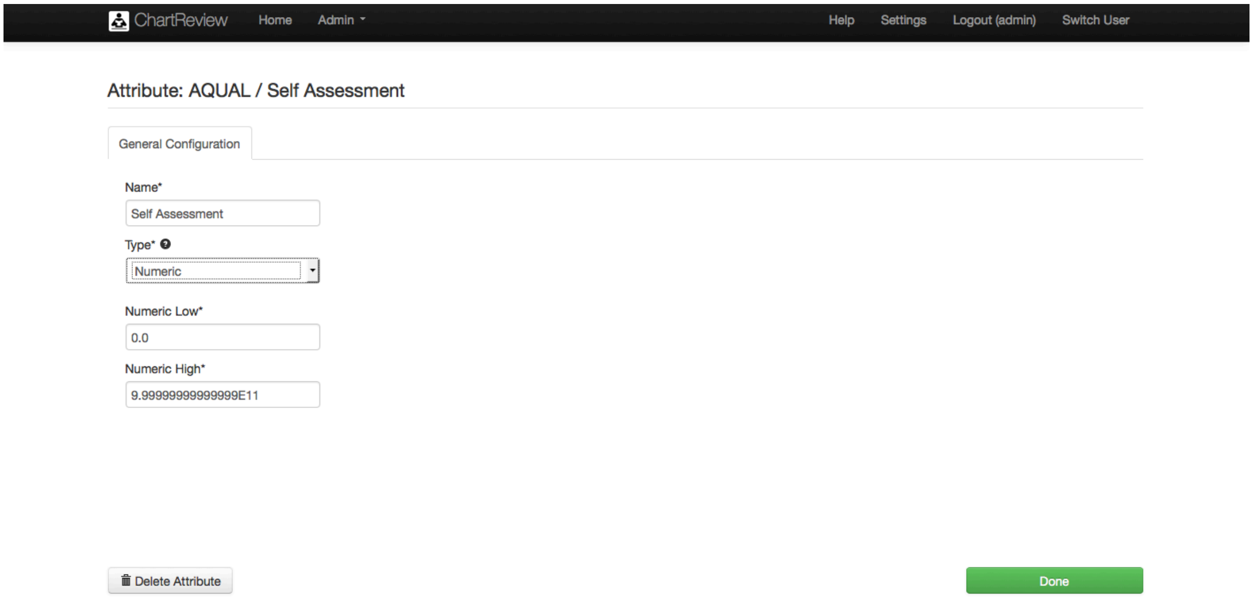


Table 38: Admin – Schema – Attribute – Create/Edit - Numeric

Item/Action	Description/Result
Name	The name of the class attribute.
Type	When numeric type is chosen, Numeric Low and Numeric High fields appear to specify a valid numeric range for the attribute.
Numeric Low	The minimum valid numeric value.
Numeric High	The maximum valid numeric value.
Delete Attribute	Deletes the attribute!
Done	Saves the changes to the attribute and takes you to the Create/Edit Schema page.

Figure 40. Admin – Schema – Attribute – Create/Edit - Date

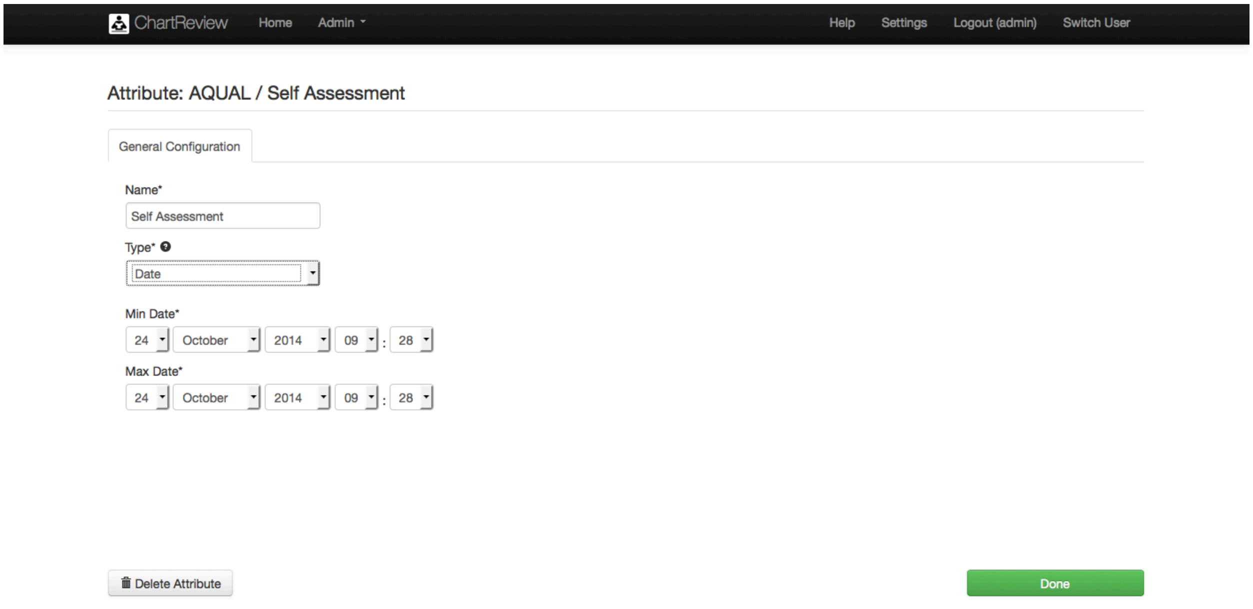


Table 39: Admin – Schema – Attribute – Create/Edit - Date

Item/Action	Description/Result
Name	The name of the class attribute.
Type	When date type is chosen, Min Date and Max Date fields appear to specify a valid date range for the attribute.
Min Date	The minimum valid date value.
Max Date	The maximum valid date value.
Delete Attribute	Deletes the attribute!
Done	Saves the changes to the attribute and takes you to the Create/Edit Schema page.

Figure 41. Admin – Schema – Attribute – Create/Edit - Option

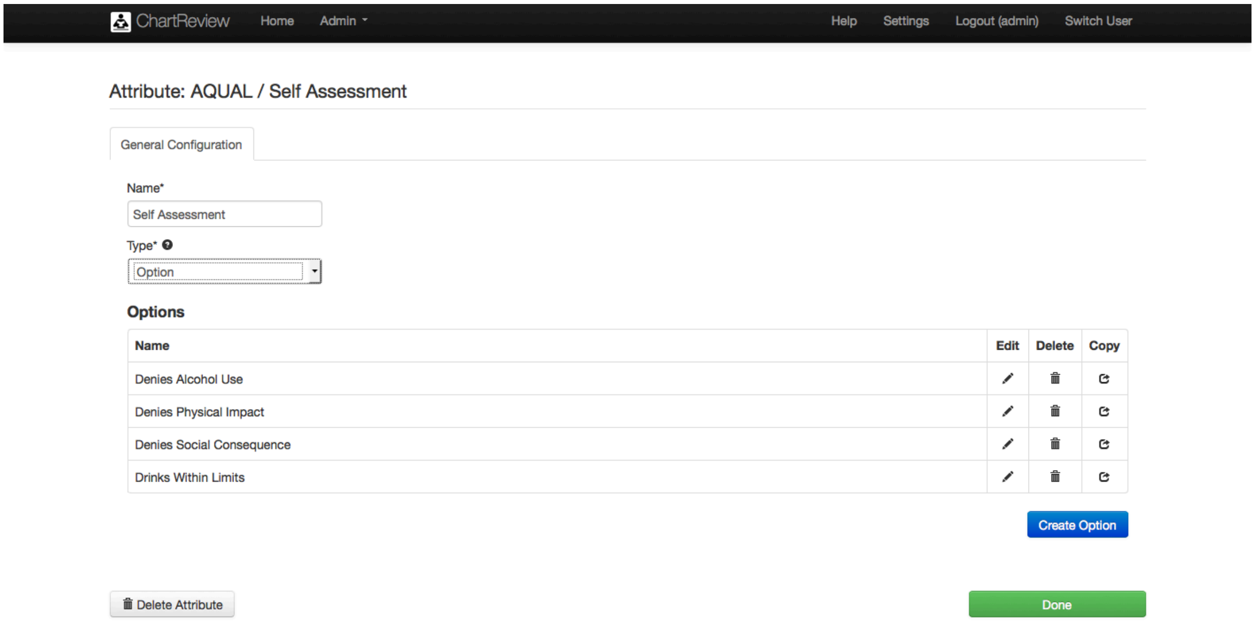


Table 40: Admin – Schema – Attribute – Create/Edit - Option

Item/Action	Description/Result
Name	The name of the class attribute.
Type	When option type is chosen, an options list and create button appear to allow valid options to be specified.
Delete Attribute	Deletes the attribute!
Done	Saves the changes to the attribute and takes you to the Create/Edit Schema page.
Options	The list of valid option values for the option attribute.
Name	The name of the option.
Edit	Takes you to the pages to edit the specified option.
Delete	Deletes the specified option!

Copy	Copies the specified option and takes you to the pages to edit it.
Create Option	Creates an option and takes you to the pages to edit it.

Figure 42. Admin – Schema – Attribute – Create/Edit - Option - Create/Edit Option

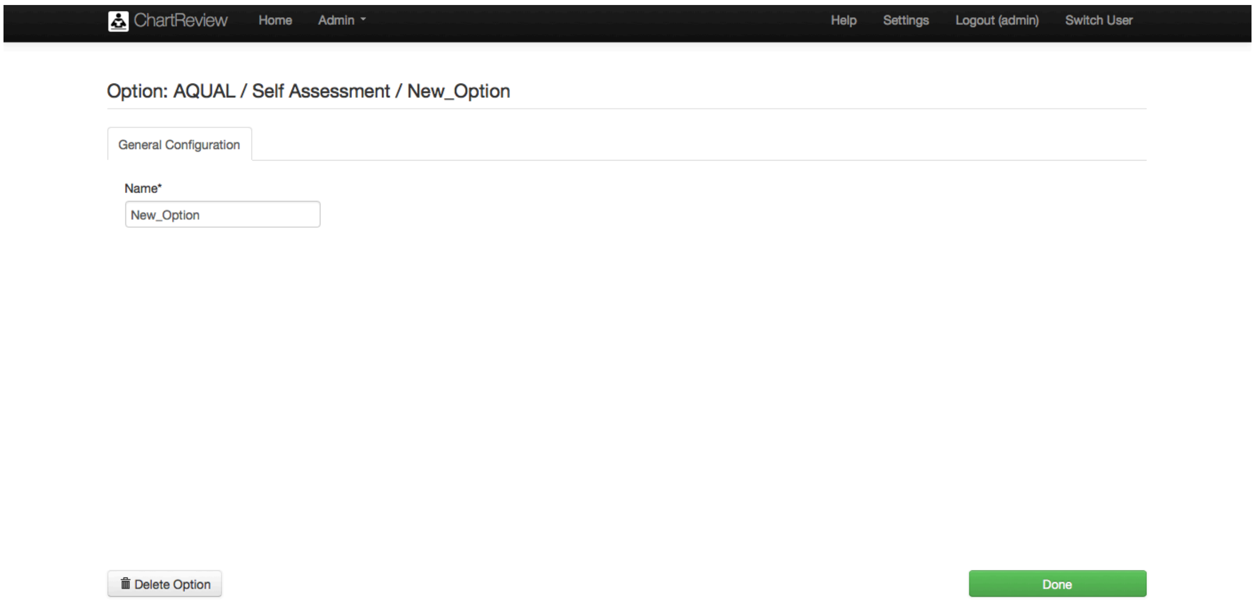


Table 41: Admin – Schema – Attribute – Create/Edit - Option

Item/Action	Description/Result
Name	The name of the option.
Delete Option	Deletes the option!
Done	Saves the changes to the option and takes you to the Create/Edit Attribute page.

Figure 43. Admin – Schema – Classifications

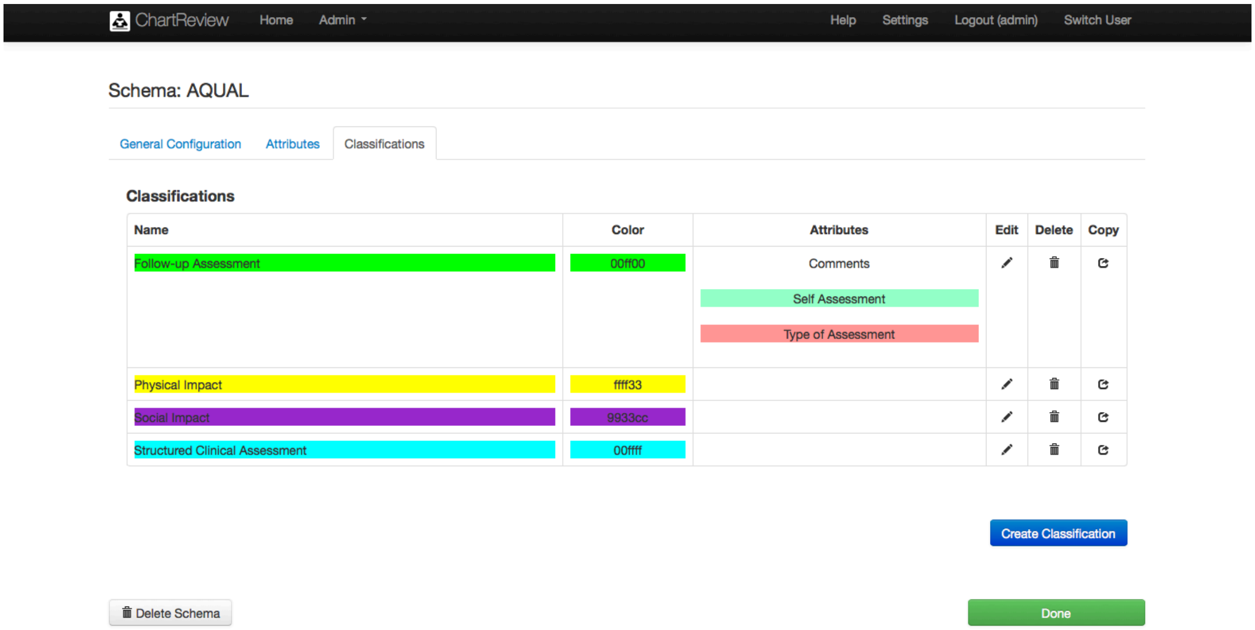


Table 42: Admin – Schema – Classifications

Item/Action	Description/Result
Name	The name of the classification.
Color	The color of the classification. This is the highlight color of an annotation span with this classification.
Attributes	The list of attributes of this classification.
Edit	Takes you to pages to edit the specified class attribute.
Delete	Deletes the specified class attribute!
Copy	Copes the specified class attribute and takes you to the pages to edit it.
Create Classification	Creates a classification and takes you to the pages to edit it.
Delete Schema	Deletes the schema!

Done	Saves the changes to the schema and takes you to the Schema List page.

Figure 44. Admin – Schema – Classification – Create/Edit – General Configuration

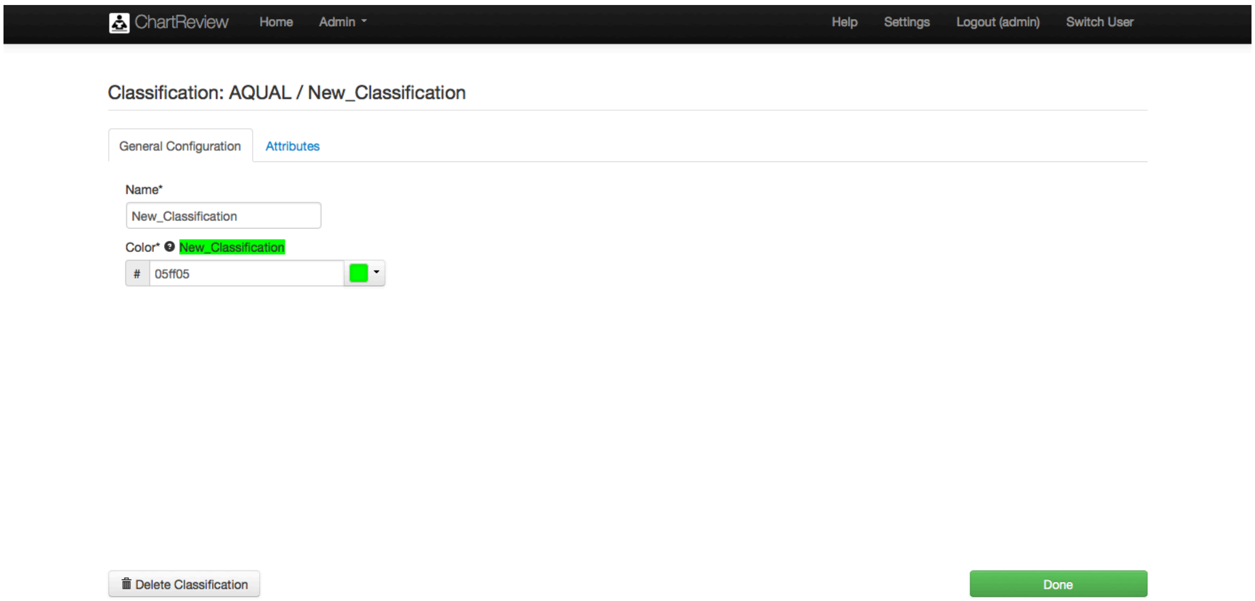


Table 43: Admin – Schema – Classification – Create/Edit – General Configuration

Item/Action	Description/Result
Name	The name of the classification.
Color Label	Shows how the color will look in a highlight.
Color	The color of the classification. This is the highlight color of an annotation span with this classification.
Delete Classification	Deletes the classification!
Done	Saves the changes to the classification and takes you to the Create/Edit Schema page.

Figure 45. Admin – Schema – Classification – Create/Edit – Attributes

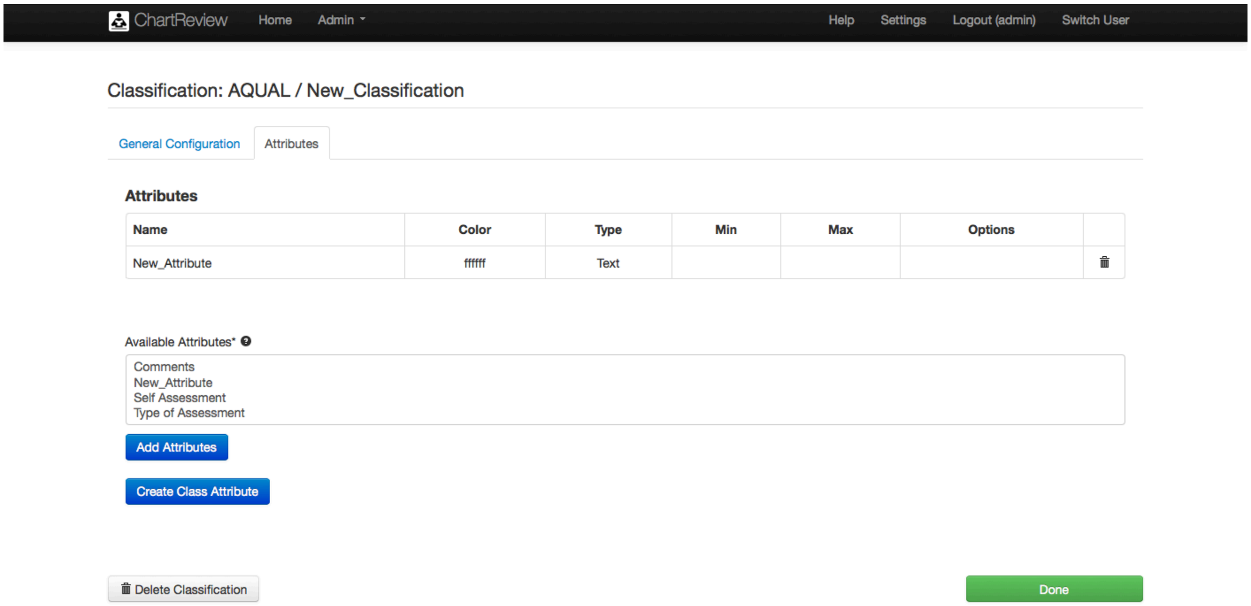


Table 44: Admin – Schema – Classification – Create/Edit - Attributes

Item/Action	Description/Result
Name	The name of the class attributes.
Color	The color of the attributes. This is the highlight color of an annotation span with this classification.
Type	The type of class attribute (i.e. Text/Numeric/Date/Options).
Min	The minimum valid numeric or date value.
Max	The maximum valid numeric or date value.
Options	The list of options for an option type class attribute.
Delete	Deletes the specified class attribute!
Available Attributes	A list of reusable attributes defined at the schema level that can be added as class attributes.
Add Attributes	Add the selected attributes to the classification as

	class attributes.
Create Class Attribute	Creates a new available class attribute and takes you to the pages to edit it. The resulting attribute shows up in the list of Available Attributes, but still needs to be added to the classification.
Delete Classification	Deletes the classification!
Done	Saves the changes to the classification and takes you to the Schema Create/Edit page.

2.6 Failed Jobs (Admin only)

The Failed Jobs item in the Admin drop down menu takes you to a list of failed workflow processes.

Note that different annotators may be participating in different annotation workflows simultaneously.

Figure 46. Admin – Failed Jobs

2.7 Process Templates (Admin only)

The Process Templates item in the Admin drop down menu takes you to the pages that allow upload and definition of process pre-defined process templates that may be used in creating process instances for a given project. Any xml file containing a process definition that uses the BMP 2.0 standard can be loaded. For example, a process defined using Activi Designer will can be loaded. Simple single step and multi-step processes should work in Chart Review. More complex process configurations have not yet been tested.

Figure 47. Admin – Process Templates

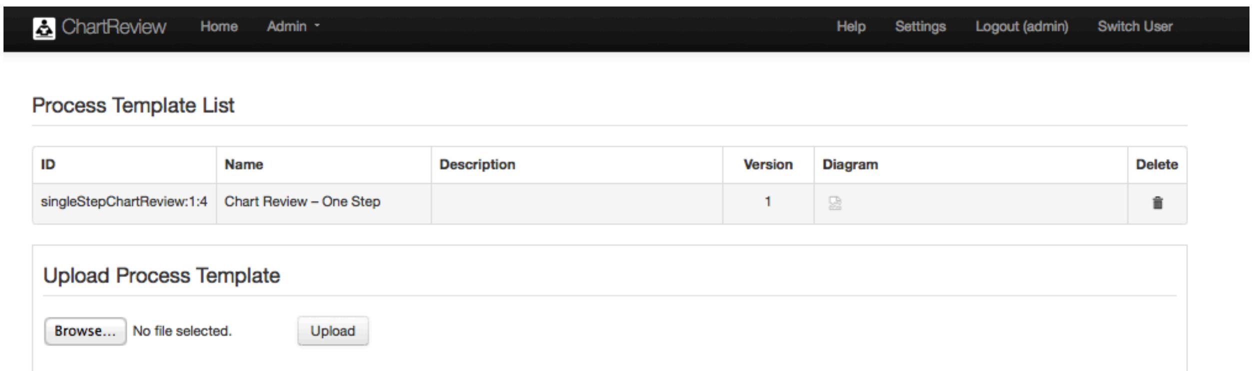


Table 45: Admin – Process Templates

Item/Action	Description/Result
Process List	List of process templates available to use when creating a process for a project. This template describes the different tasks that need to be defined and executed as part of an annotation process workflow. It follows the BMP 2.0 process definition standard.
ID	The id of the process template.
Name	Name of the process template presented in the Project process definition.
Description	Description of the process template.
Version	Version of the process template.
Diagram	Diagram of the process template. Clicking on the diagram button opens a new browser window and

	displays the diagram.
Delete	Deletes the process template!
Upload Process Template	Allows upload of any xml file containing a process definition that uses the BMP 2.0. For example, a process defined using Activi Designer will can be loaded. Simple single step and multi-step processes should work in Chart Review. More complex process configurations have not yet been tested.
Browse	Find the BMP 2.0 xml process definition file in the browser's local file system.
Upload	Uploads the process template to the database.

2.8 Tools and Utilities (Admin only)

The Process Templates item in the Admin drop down menu takes you to the pages that provide tools and utilities to kill processes and view API documentation, for example.

Figure 48. Admin - Tools and Utilities

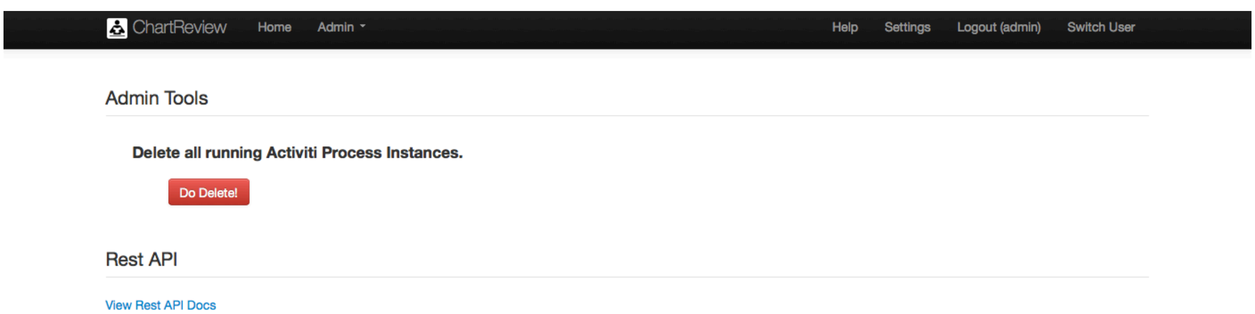


Table 46: Admin – Tools and Utilities

Item/Action	Description/Result
Admin Tools	Area for various system administration activies.
Delete all running Actviti Process Instances – Do Delete	Deletes all processes and tasks from all projects!!! Annotations from any of those tasks will not be deleted, but an annotation's association with the

	task for which it was generated will no longer exist.
Rest API	Area to access various API documents.
View Rest API Docs	Takes you to pages to view the Chart Review API documents generated by the JSONDoc subsystem. To get back from these pages, press the browser back button, because the Chart Review banner will not be available in this page space.

Figure 49. Admin - Tools and Utilities – API Docs

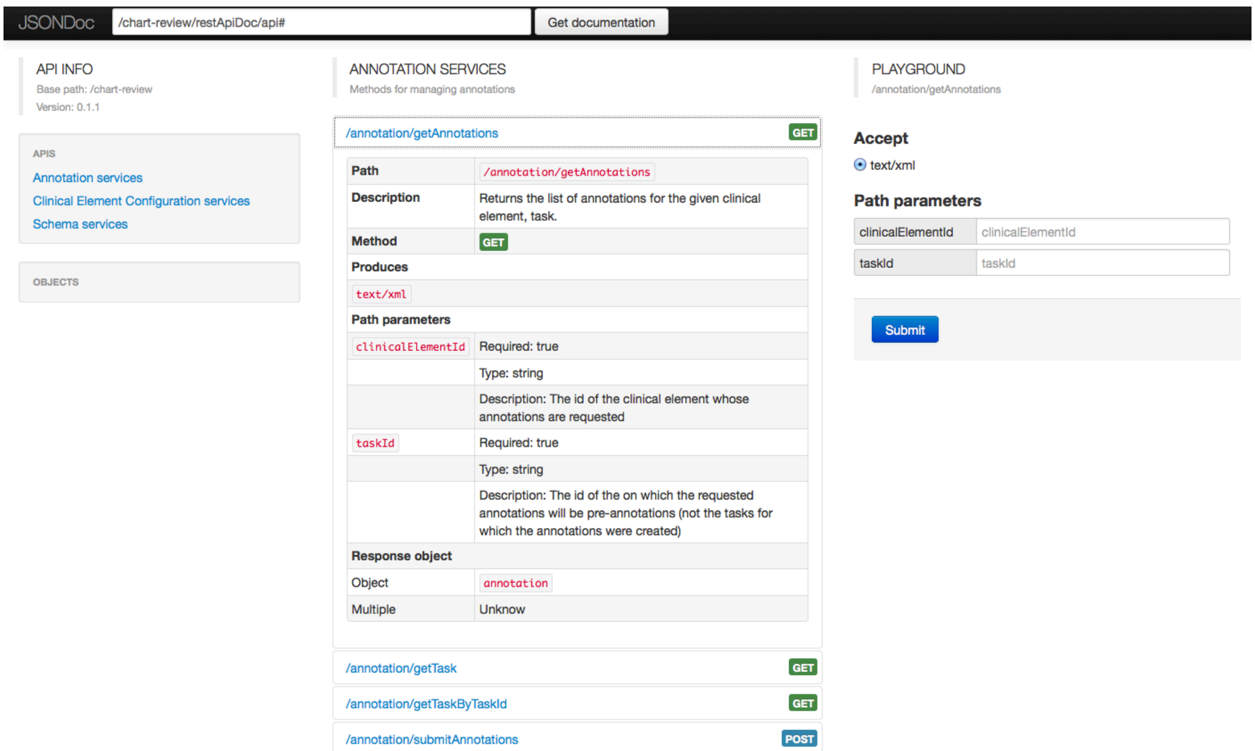


Table 47: Admin – Tools and Utilities – API Docs

Item/Action	Description/Result
Various	These pages describe the web services the available in Chart Review to get and submit annotations, clinical element configurations, and annotation schemas programmatically. To get back from these pages, press the browser back button, because the Chart Review banner will not be available in this page space. A detailed description of how to use

	these pages is out of the scope of this document. Please see JSONDoc documentation for details.

2.9 Users (Admin only)

The Process Templates item in the Admin drop down menu takes you to the pages that allow user definition and maintenance.

Figure 50. Admin - Users

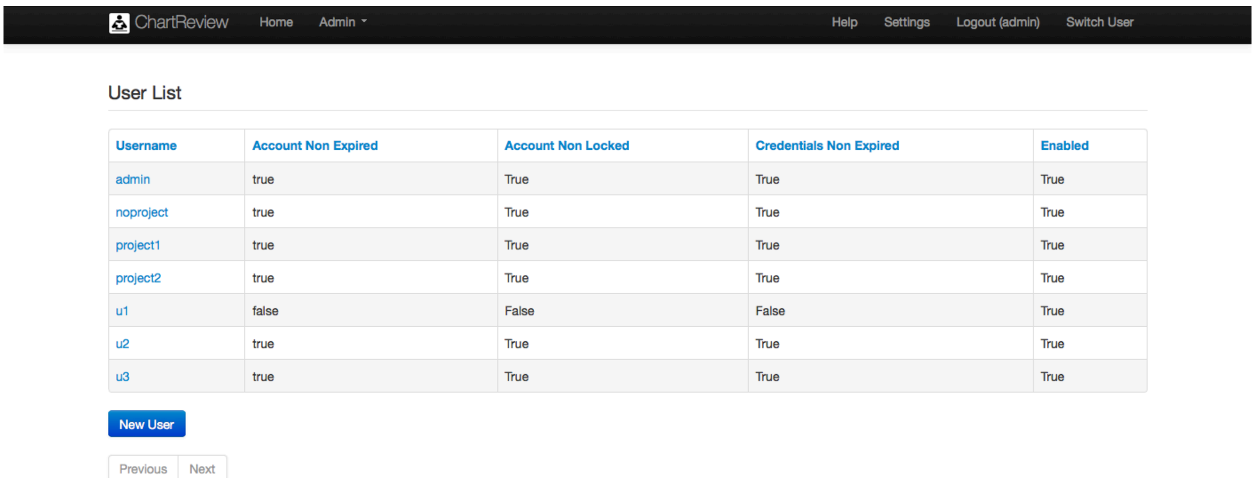


Table 48: Admin – Users

Item/Action	Description/Result
Username Column	Sorts the user list by username.
Username	The name of each user.
Username link	Takes you to the pages to show user information.
Account Non Expired Column	Sorts the user list by account non-expired status.
Account Non Expired	True if the user account is active. False if the user account exists but is expired. The user cannot use the account. See the system administrator to reset.
Account Non Locked Column	Sorts the user list by account non-locked status.

Account Non Locked	True if the user account is NOT locked. False if the user account exists, but is currently locked. This is usually automatically set because of invalid login attempts. The user may not used the account. See the system administrator to reset.
Credentials Non Expired Column	Sorts the user list by credentials non-expired status.
Credentials Non Expired	True if the current password is not expired. This is set this to False to force the user to enter a new password.
Enabled Column	Sorts the user list by enabled status.
Enabled	True if the user account is enabled. False if the user account has been disabled by the system administrator. See the system administrator to find out why.

Figure 51. Admin – Show User

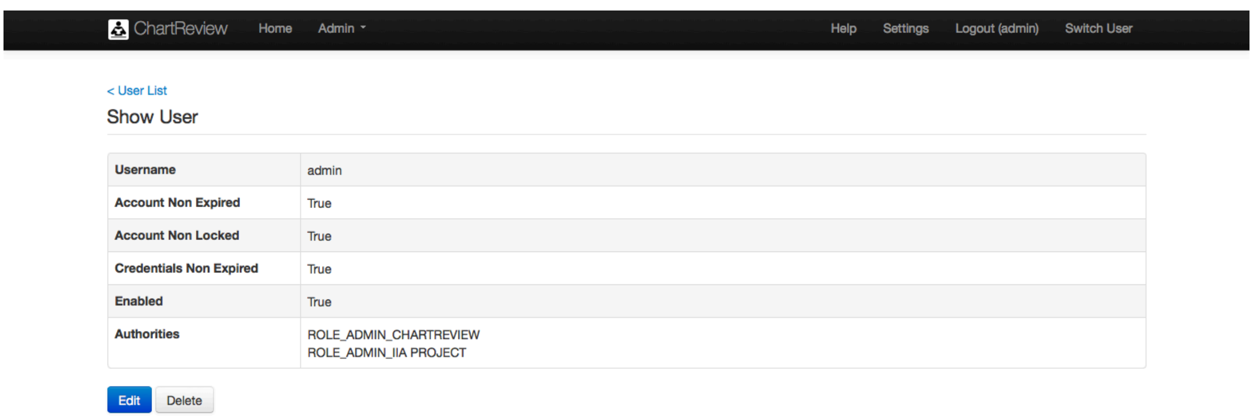


Table 49: Admin – Show User

Item/Action	Description/Result
User List link	Takes you back to the User List.
Username	The name of each user.
Account Non Expired	True if the user account is active. False if the user

	account exists but is expired. The user cannot use the account. See the system administrator to reset.
Account Non Locked	True if the user account is NOT locked. False if the user account exists, but is currently locked. This is usually automatically set because of invalid login attempts. The user may not used the account. See the system administrator to reset.
Credentials Non Expired	True if the current password is not expired. This is set this to False to force the user to enter a new password.
Enabled	True if the user account is enabled. False if the user account has been disabled by the system administrator. See the system administrator to find out why.
Authorities	A list of the roles that the user has on various projects.
Edit	Takes you to the pages to edit the user account definition.
Delete	Deletes the user!

Figure 52. Admin – Edit User

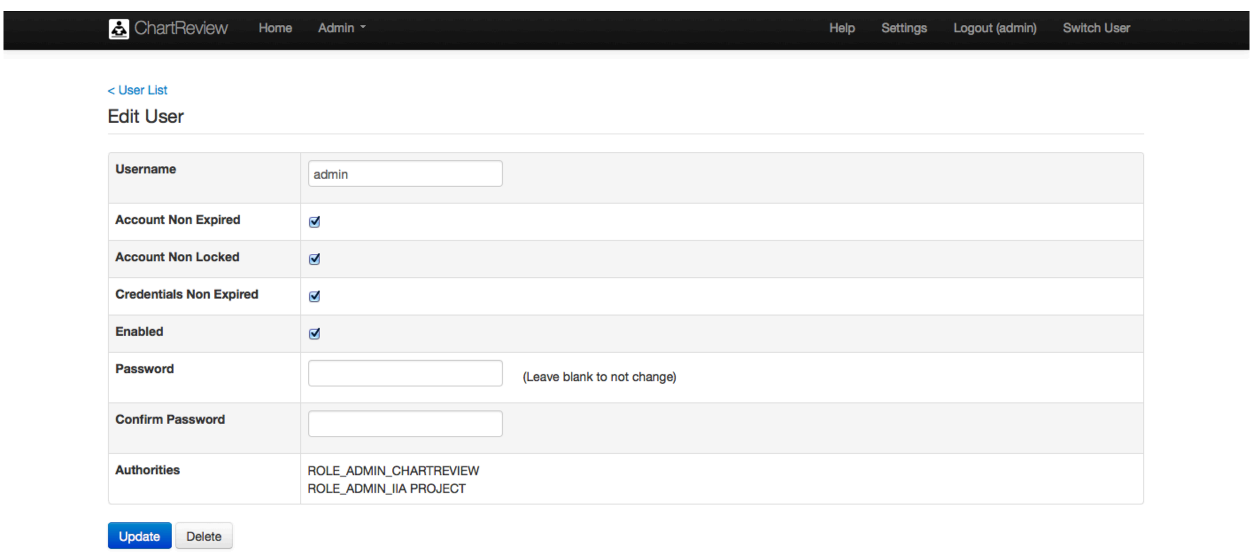


Table 50: Admin – Show User

Item/Action	Description/Result
User List link	Takes you back to the User List.
Username	The name of each user.
Account Non Expired	True if the user account is active. False if the user account exists but is expired. The user cannot use the account. See the system administrator to reset.
Account Non Locked	True if the user account is NOT locked. False if the user account exists, but is currently locked. This is usually automatically set because of invalid login attempts. The user may not used the account. See the system administrator to reset.
Credentials Non Expired	True if the current password is not expired. This is set this to False to force the user to enter a new password.
Enabled	True if the user account is enabled. False if the user account has been disabled by the system administrator. See the system administrator to find out why.
Authorities	A list of the roles that the user has on various projects.
Update	Saves the changes to the User account.
Delete	Deletes the user!

2.10 About (Admin only)

The About item in the Admin drop down menu takes you to the pages that show information about the application, its version, structure, dependencies, and components.

Figure 53. Admin - About

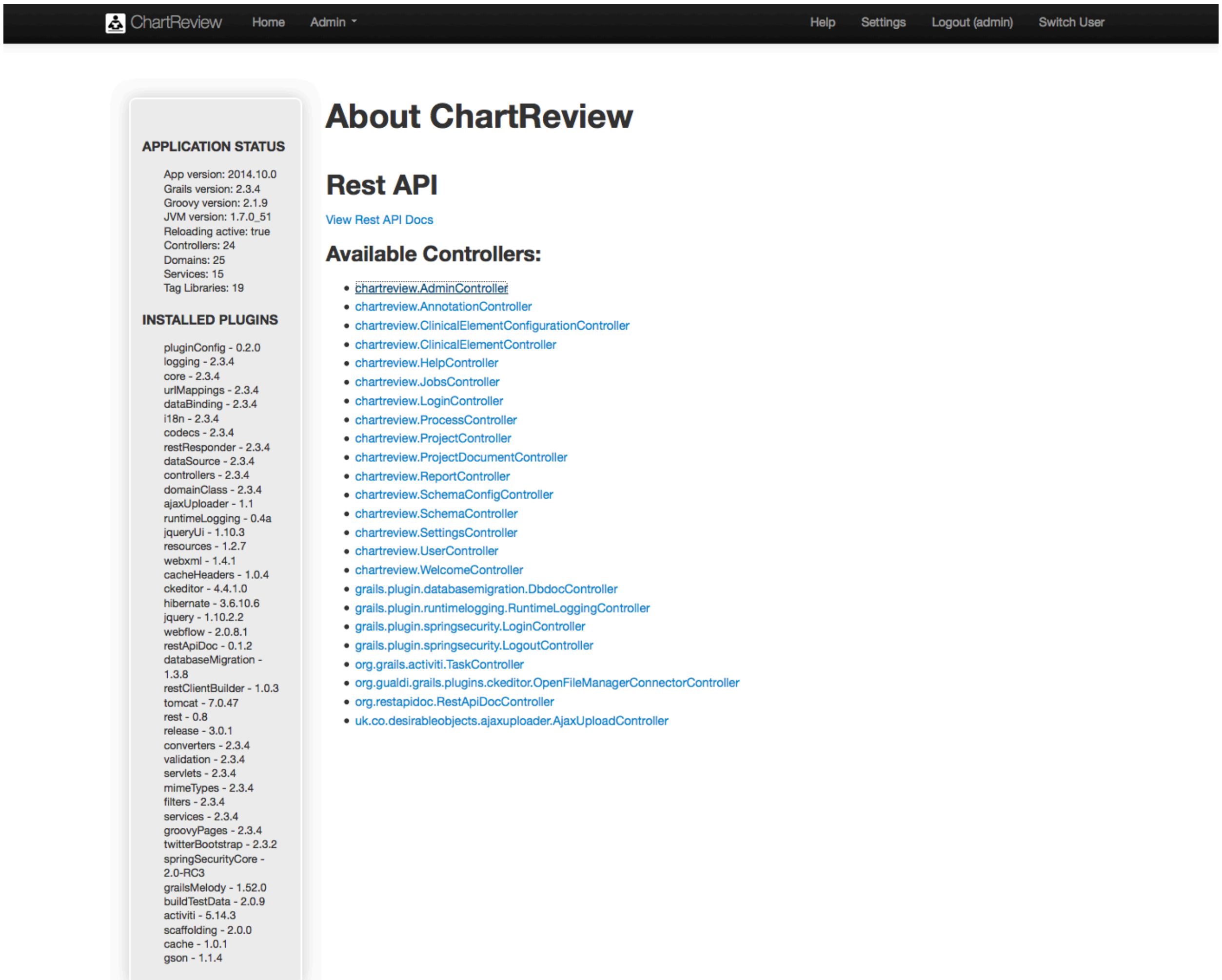


Table 51: Admin – About

Item/Action	Description/Result
Application Status	Version information about Chart Review and its major technology subsystems. Counts of system components.
Installed Plugins	A list of the plugin components used by this application with their version numbers.

View Rest API Docs	Takes you to pages to view the Chart Review API documents generated by the JSONDoc subsystem. To get back from these pages, press the browser back button, because the Chart Review banner will not be available in this page space.
Available Controllers	These links call the various controllers they represent. These may be used for system understanding and programmer testing.

Figure 54. Admin - About – API Docs

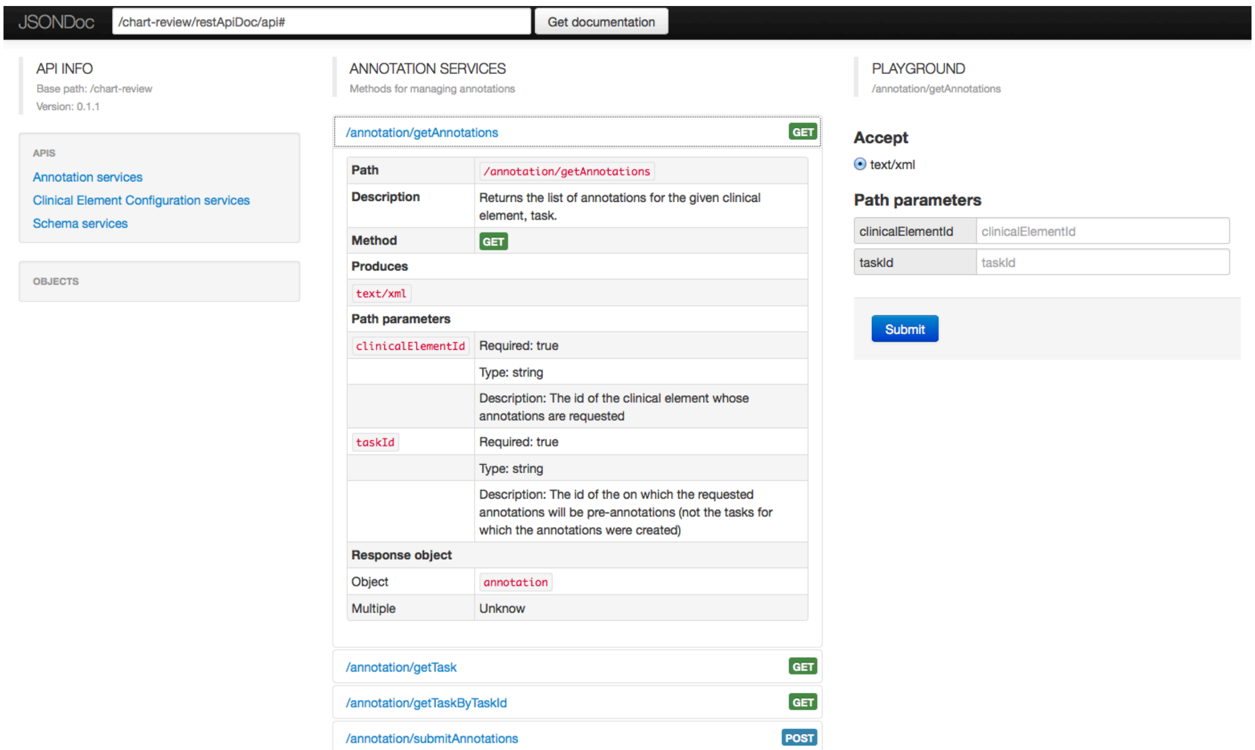


Table 52: Admin – About – API Docs

Item/Action	Description/Result
Various	These pages describe the web services the available in Chart Review to get and submit annotations, clinical element configurations, and annotation schemas programmatically. To get back from these pages, press the browser back button, because the Chart Review banner will not be available in this page space. A detailed description of how to use these pages is out of the scope of this document.

	Please see JSONDoc documentation for details.

2.11 Log Level (Admin only)

The Log Level item in the Admin drop down menu takes you to the pages that allow control over the various levels of system logging available.

Figure 55. Admin - Log Level

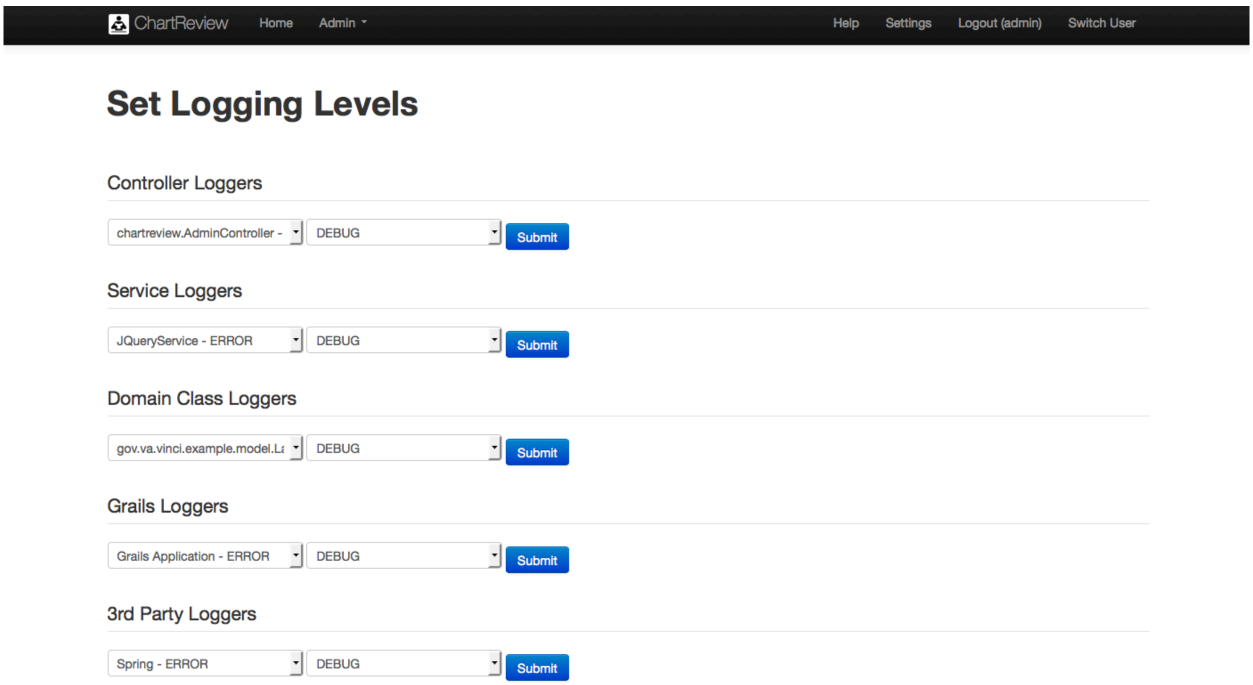


Table 53: Admin – Log Level

Item/Action	Description/Result
Controller Loggers	Allows you to set the logging level that Grails controllers use to log to the chart-review log file found in the Tomcat logs directory.
Service Loggers	Allows you to set the logging level that Grails services use to log to the chart-review log file found in the Tomcat logs directory.
Domain Class Loggers	Allows you to set the logging level that Grails domain classes use to log to the chart-review log

	file found in the Tomcat logs directory.
Grails Loggers	Allows you to set the logging level that Grails itself uses to log to the chart-review log file found in the Tomcat logs directory.
3rd Party Loggers	Allows you to set the logging level that Grails 3rd party plugins use to log to the chart-review log file found in the Tomcat logs directory.

2.12 Performance Monitoring (Admin only)

The Performance Monitoring item in the Admin drop down menu takes you to the pages that show performance monitoring analytics about the Chart Review system itself.

Figure 56. Admin – Performance Monitoring – Top

Figure 57. Admin – Performance Monitoring - Bottom

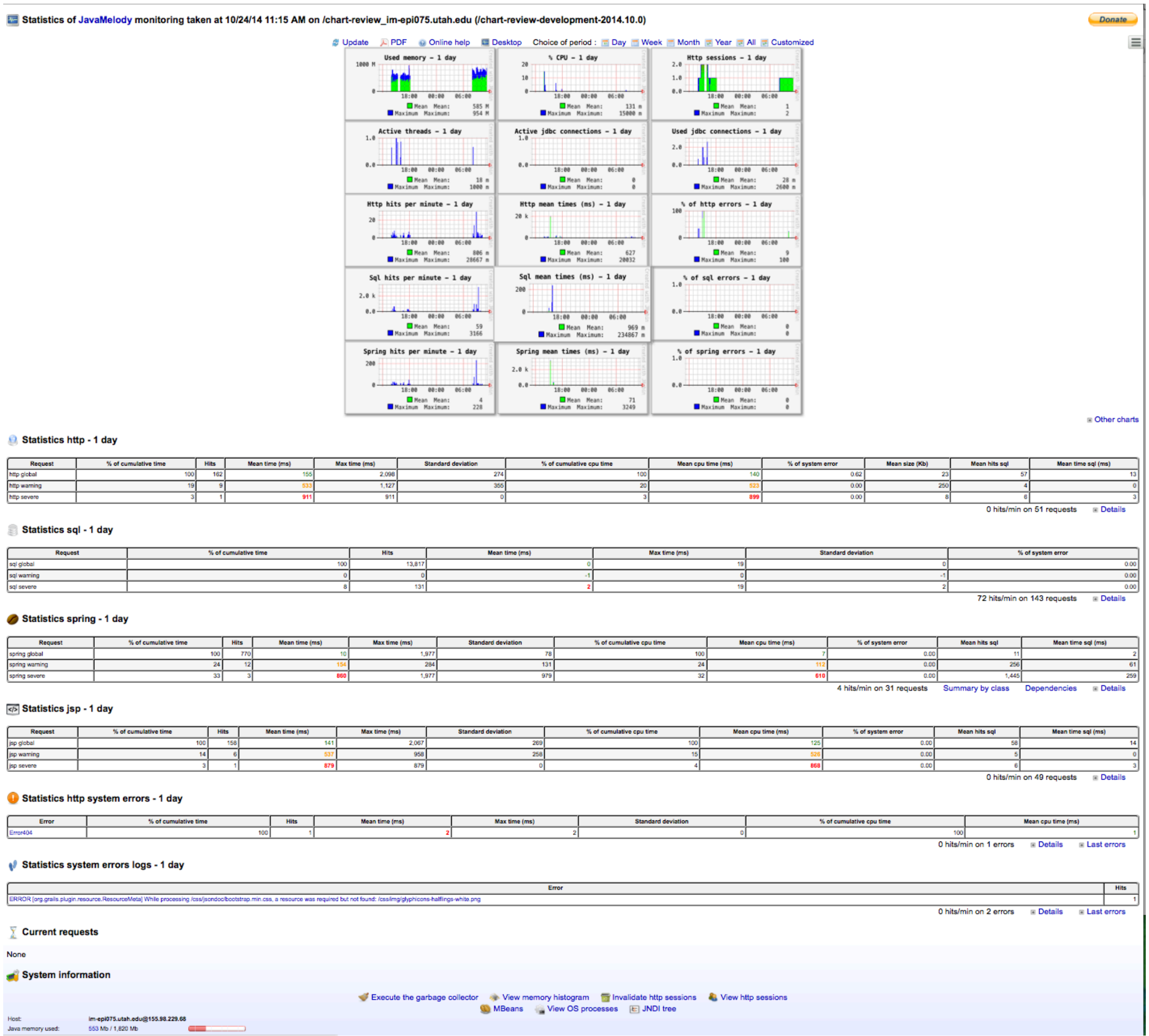


Table 54: Admin – Performance Monitoring

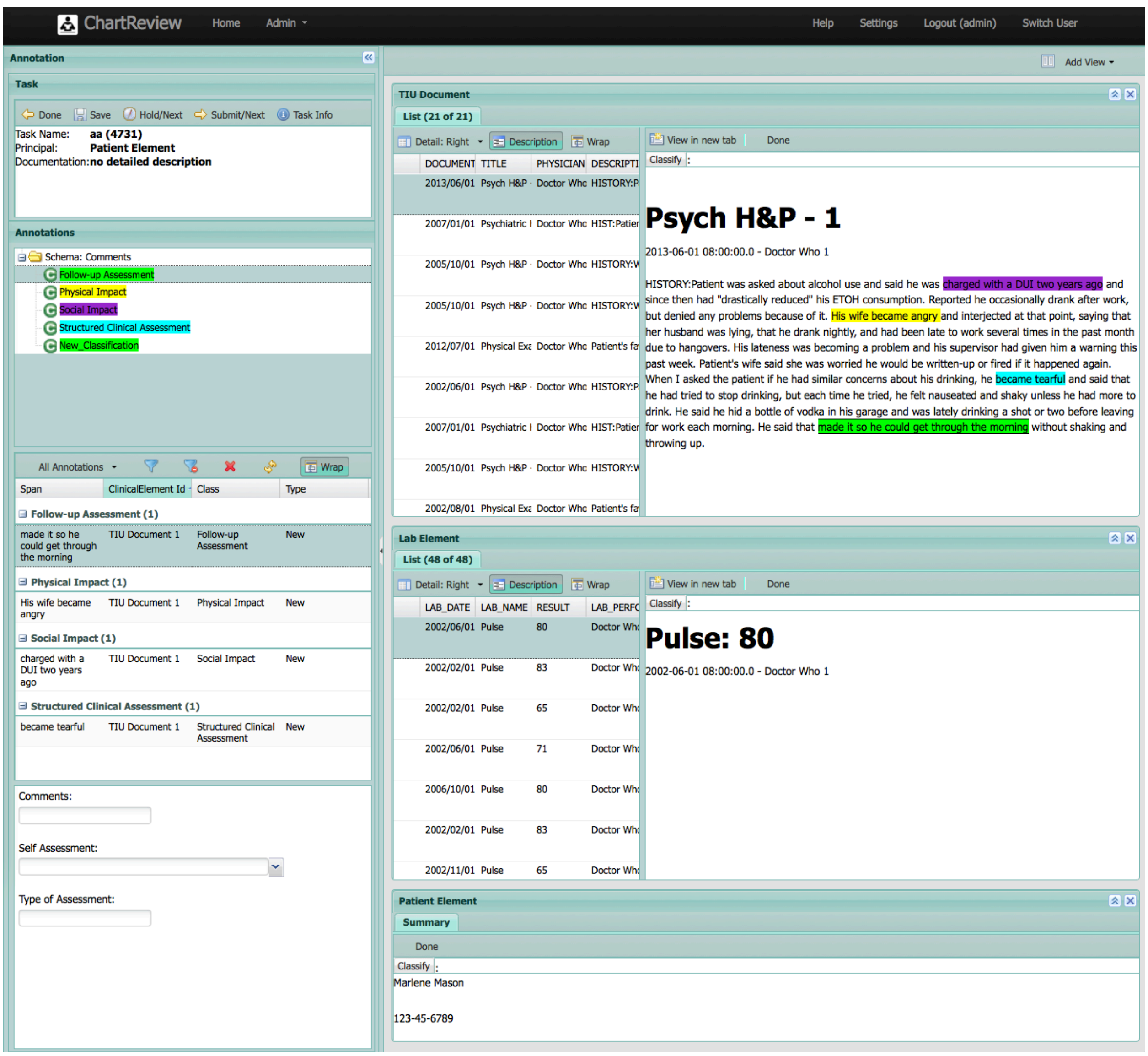
Item/Action	Description/Result
Various	These pages describe the performance of the Chart Review system as tracked by the JavaMelody monitoring subsystem. To get back from these pages, press the browser back button, because the Chart Review banner will not be available in this page space. A detailed description of how to use these pages is out of the scope of this document. Please see JavaMelody documentation for details.

3 Chart Review

3.1 Overview

Chart Review is a web application that allows manual annotations to be made on multiple elements and multiple levels of a medical chart simultaneously. The task of classifying a cohort of patients can be done as a patient is reviewed in the full context of his clinical notes, labs, procedures, problems and medications. Or a corpus of notes can be annotated in the context of the patient, labs, problems, procedures and medications that clarify the notes. The type and set of clinical elements that can be viewed as part of an annotation task is completely customizable and configurable by an annotation project administrator.

Figure 58. Chart Review



Annotators who have been assigned to an annotation project can open Chart Review with a new or previous assignment that they have been given from the an annotation process defined in the project and see the requirements of the task and all of the information necessary to perform the annotation task that has been assigned. Annotators can finish a task, move to another task, or put a task on hold. Within the Chart Review tool, an annotator can peruse a chart independent of the annotation task at hand (he can collapse the annotation panel entirely), or he can be taken to the parts of the chart that have been pre-annotated by sorting, filtering, grouping, and selecting annotations from the annotation list that show features of interest in the chart. In addition, the annotator has control over the content and layout of the chart presentation as well as the annotation list. The following sections describe how the Chart Review tool can be used to accomplish an annotation task.

3.2 Quick-Start

The following outlines the basic annotation workflow steps, starting from the Chart Review Home page:

1. **Pick** a **project and process**
2. Press **Get Next Assignment**
3. Find out what annotation is required by **press**ing the **Task Info** button in the task panel
4. **Select** the appropriate schema **classification** for the task
5. **Scroll** to the clinical element **view**
6. **Select** a clinical element **item**
7. **Scroll** to the desired place in the **content** text
8. **Highlight** the desired **text** (an annotation will appear in the annotations list on the left)
9. **Fill out** any annotation attribute **features** presented in the annotation editor panel on the lower left
10. When annotation is finished, **press Submit/Next** to submit the annotations and get the next task

That's it!

3.3 Initiating a Chart Review

A user can see his recent task work for a given project and process, including work on completed processes. A user can fetch a new task assignment or work on existing open assignments, or assignments that have been put on hold.

Figure 59. Chart Review – Initiating a Chart Review

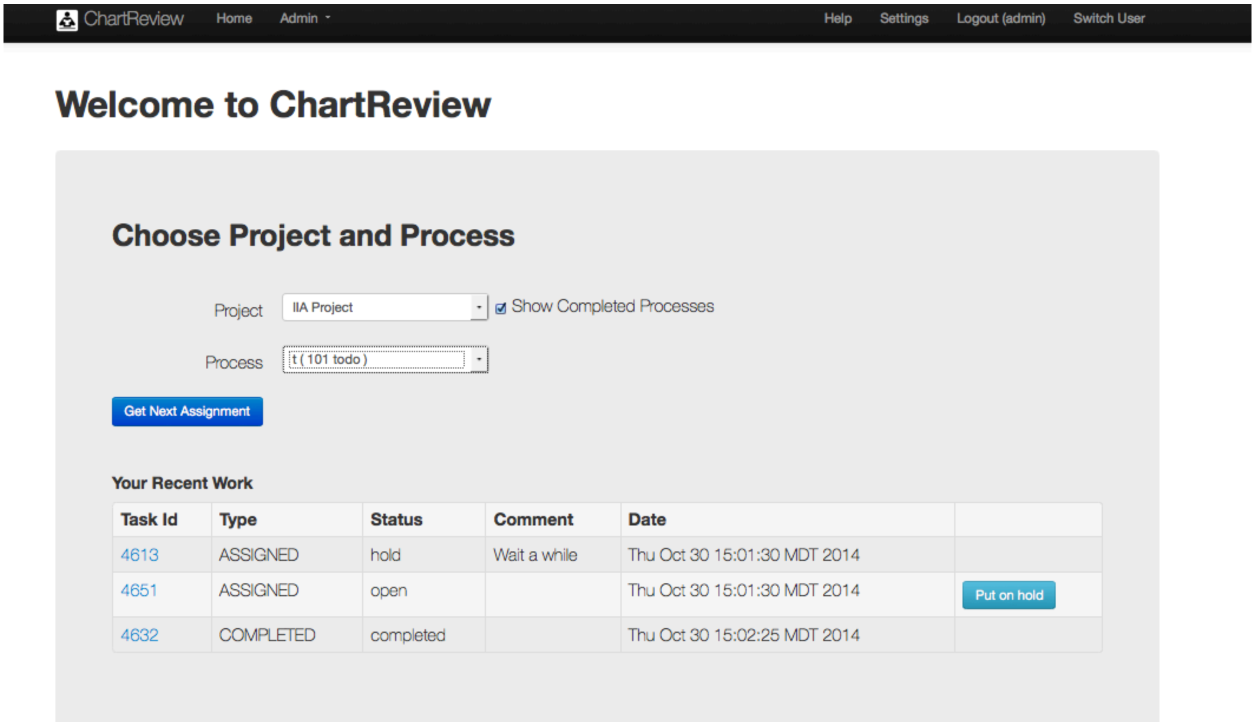


Table 55: Chart Review – Initiating a Chart Review

Item/Action	Description/Result
Project	The project you want to perform an annotation task on.
Show Completed Processes	If checked, completed processes are provided in the Process dropdown as well as incomplete processes.
Process	The project process workflow you want to perform an annotation task on.
Get Next Assignment	Gets a new task assignment from the chosen project process and initiates chart review on that task. The task moves to an ASSIGNED state. Note that the processes listed in the Process dropdown show how many unassigned tasks they have left.

Your Recent Work	This is a list of tasks that have been assigned to you for the specified project process. These tasks may be open, on hold, or completed.
Task Id link	Initiates chart review on the specified task.
Task Id	The id of the task.
Type	ASSIGNED/COMPLETED
Status	open/hold/completed
Comment	A comment that was added for a hold.
Date	The date/time the task was assigned or completed.

3.4 Layout Options

A reviewer has several layout options available, including:

3.4.1 Two Column Mode

Two column mode allows a user to have two instances of the same type of clinical element view open side by side for comparison. For example, a user could open a note that was annotated well, according to the task standard and use it to guide annotation of another note of the same type of clinical element.

Figure 60. Chart Review – Two Column Mode

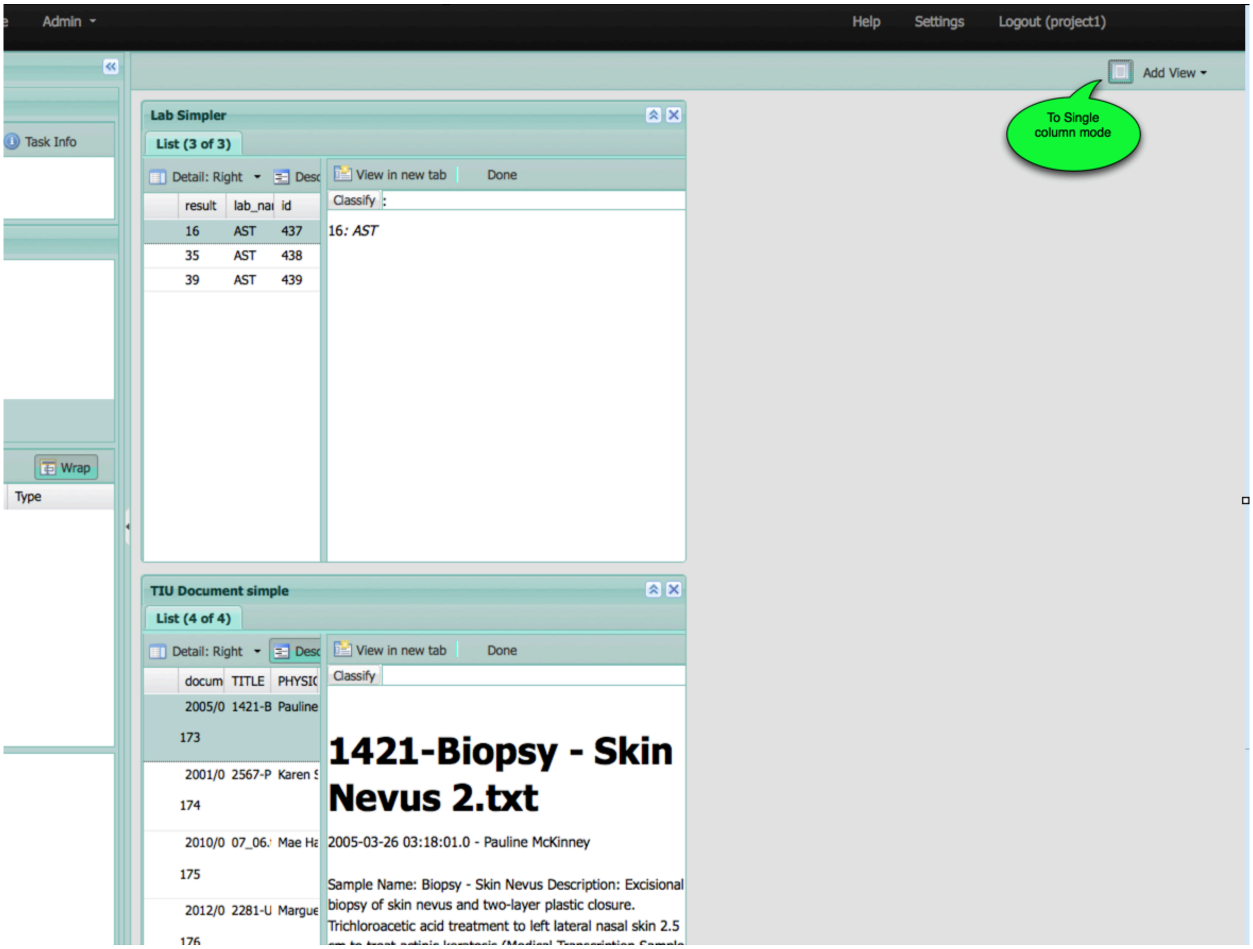


Figure 61. Chart Review – Single Column Mode

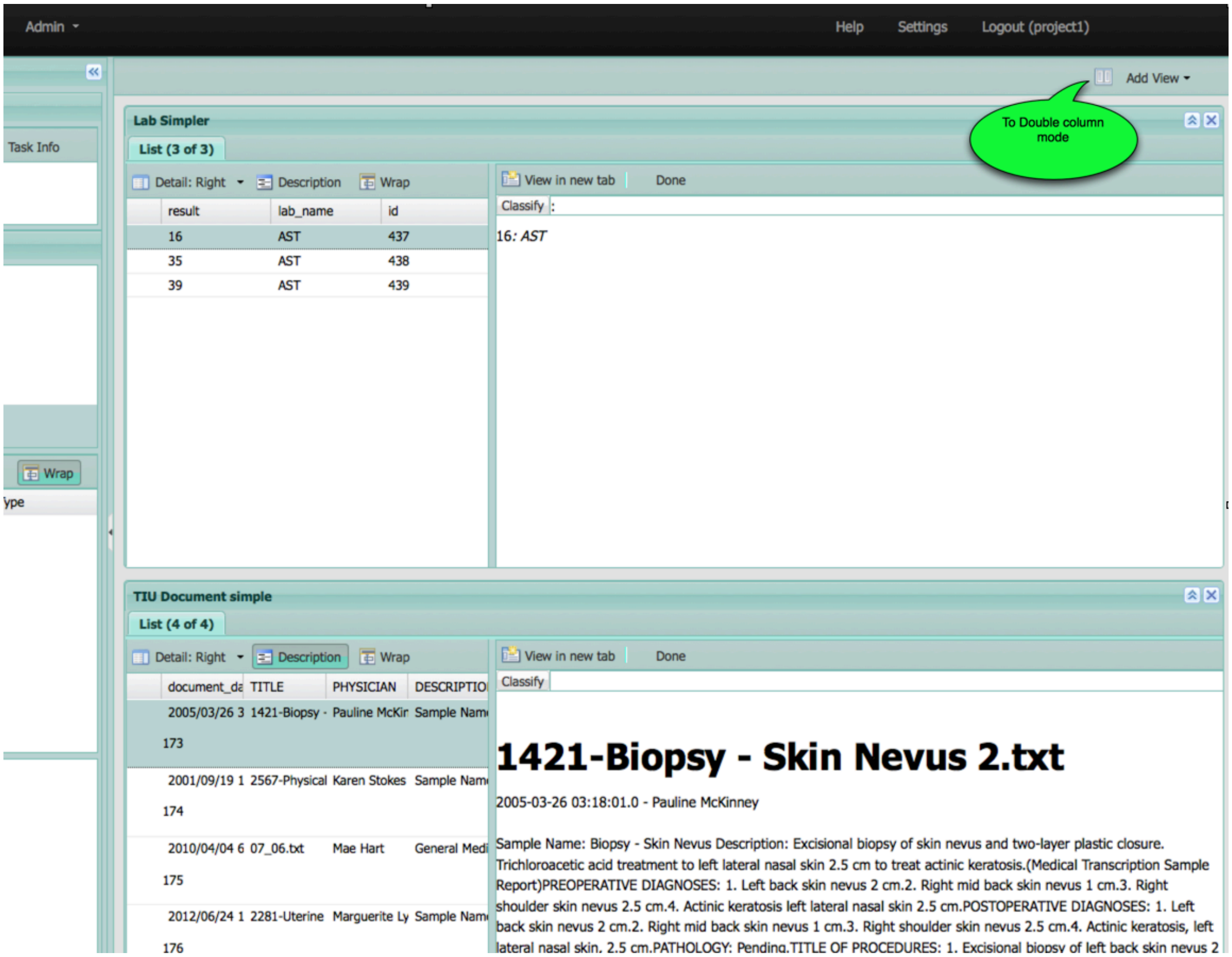


Table 56: Chart Review – Two Column Mode

Item/Action	Description/Result
Two Column Mode Toggle (app upper right)	Toggles between two columns and one column, distributing the views between the two columns or coalescing them into one column.
Auto-Select	

3.4.2 Variable Height Views

View height can be adjusted by dragging the bottom or top borders of the view window.

Figure 62. Chart Review – Variable Height Views

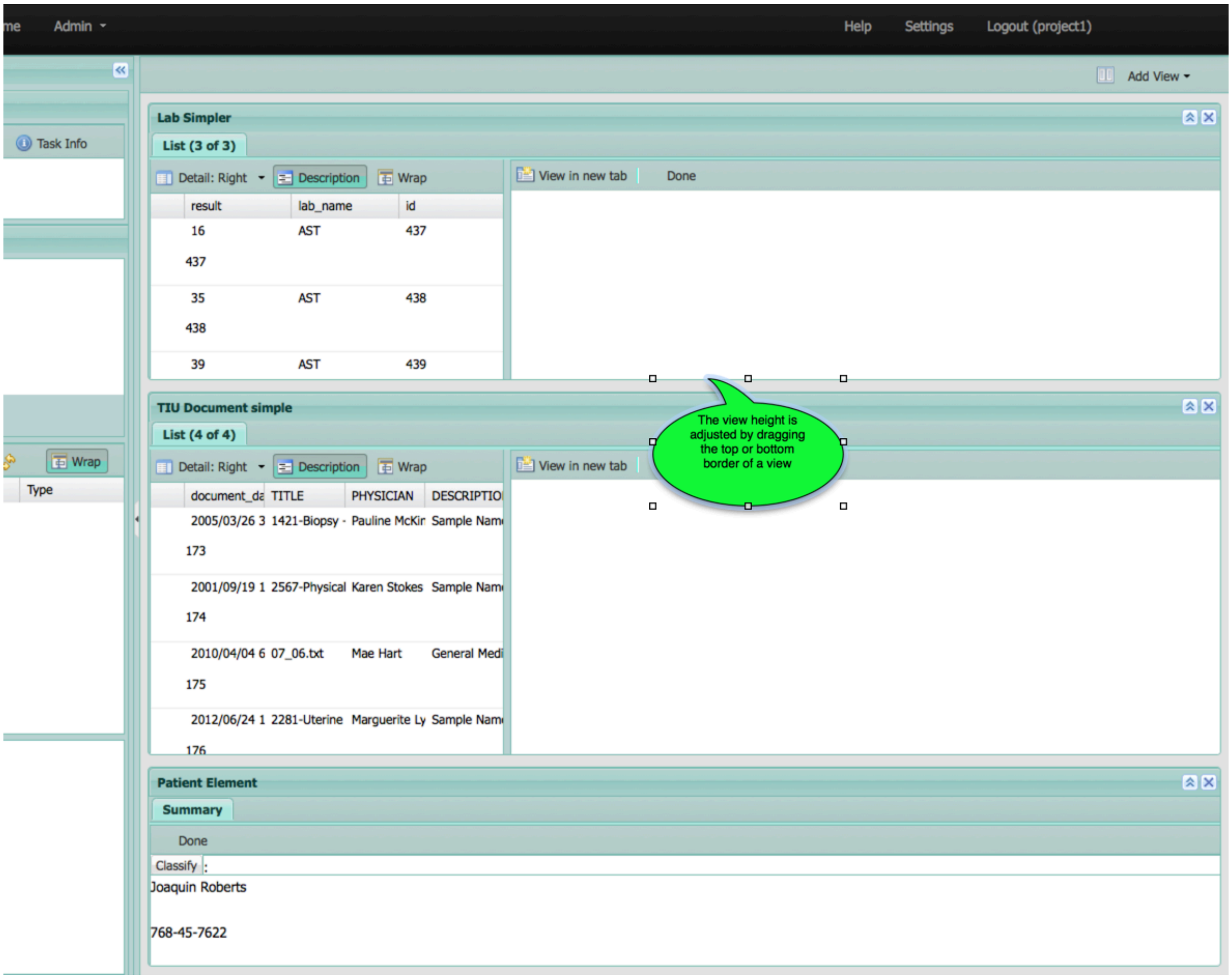


Table 57: Chart Review – Variable Height Views

Item/Action	Description/Result
Drag View Top/Bottom	Adjusts the height of the view.

3.4.3 View Detail Docking/Hiding Options

A clinical element view of type LIST has a grid part and a detail part. The user may change the docking of the detail panel to the right or the bottom. He may also choose to hide the detail panel altogether through the Detail dropdown button

Figure 63. Chart Review – View Detail Docking/Hiding Options

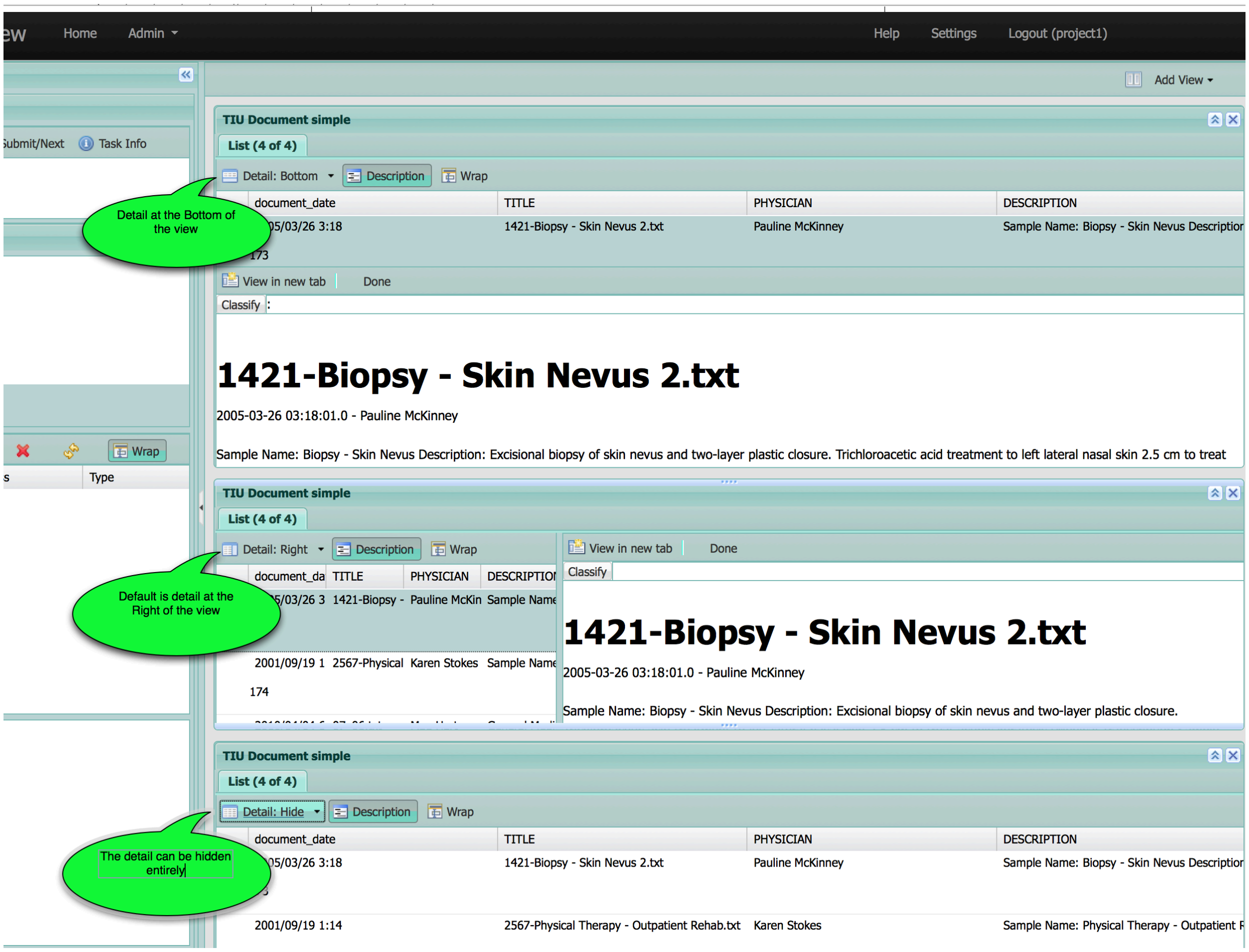


Table 58: Chart Review – Variable Height Views

Item/Action	Description/Result
Detail Right (default)	Shows the detail at the right of the view.
Detail Bottom	Shows the detail at the bottom of the view.
Detail Hide	Hides the detail from the view.

3.4.4 Optional Column Inclusion

Columns may be optionally included/excluded from the grid view. Column inclusion/exclusion is toggled through the column header dropdown menu.

Figure 64. Chart Review – Optional Column Inclusion

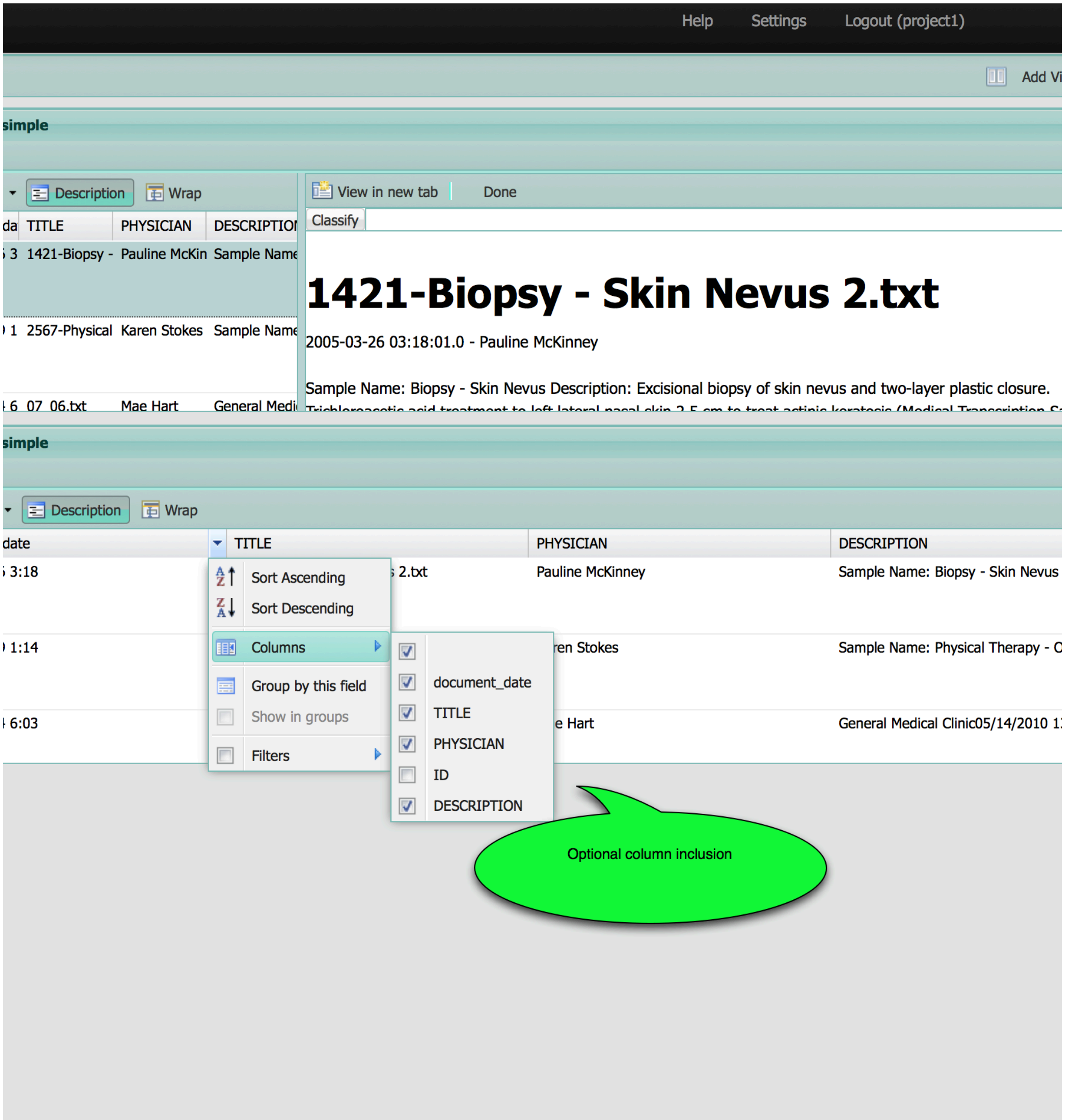


Table 59: Chart Review – Optional Column Inclusion

Item/Action	Description/Result
Dropdown on Right of Colum -> Columns	Toggles the visibility of each column that has Include checked in the process task definition.

3.4.5 List Sorting

The grid list may be sorted ascending/descending by any of the columns. Column sorting is toggled through the column header dropdown menu.

Figure 65. Chart Review – List Sorting

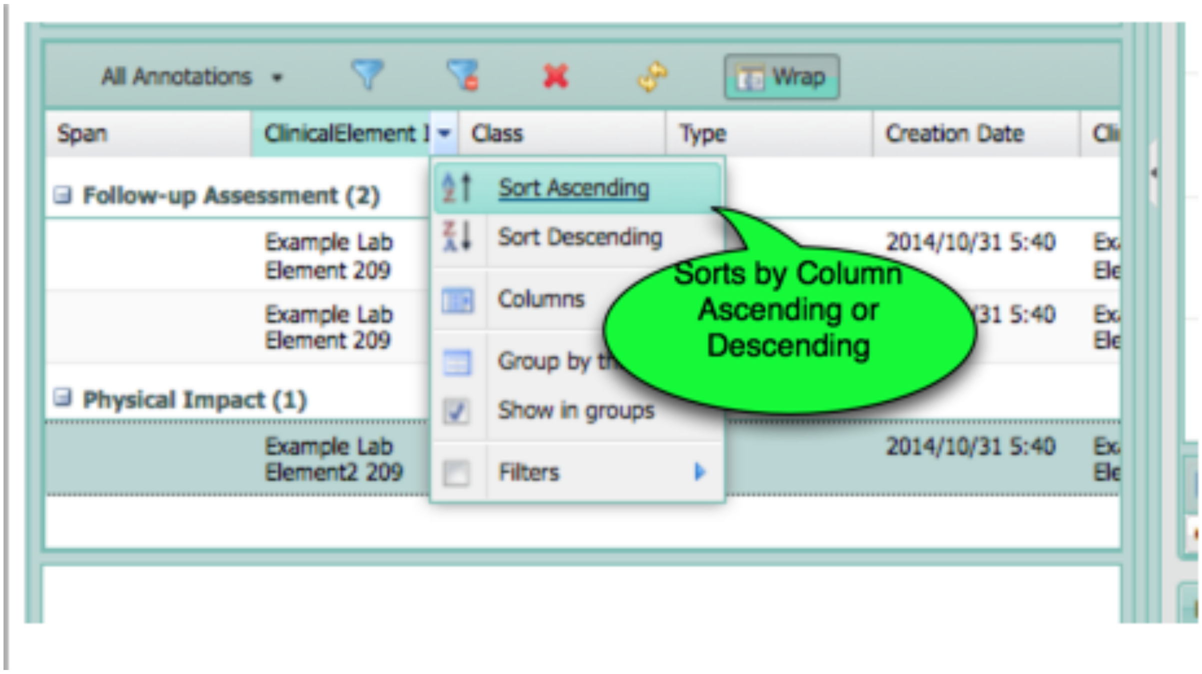


Table 60: Chart Review – List Sorting

Item/Action	Description/Result
Dropdown on Right of Column -> Sort Ascending/Descending	Sorts by the column values ascending or descending. An indicator is displayed on the column header to show column sort and direction.

3.4.6 List Grouping

The grid list may be grouped by any of the columns. Column grouping is toggled through the column header dropdown menu.

Figure 66. Chart Review – List Grouping

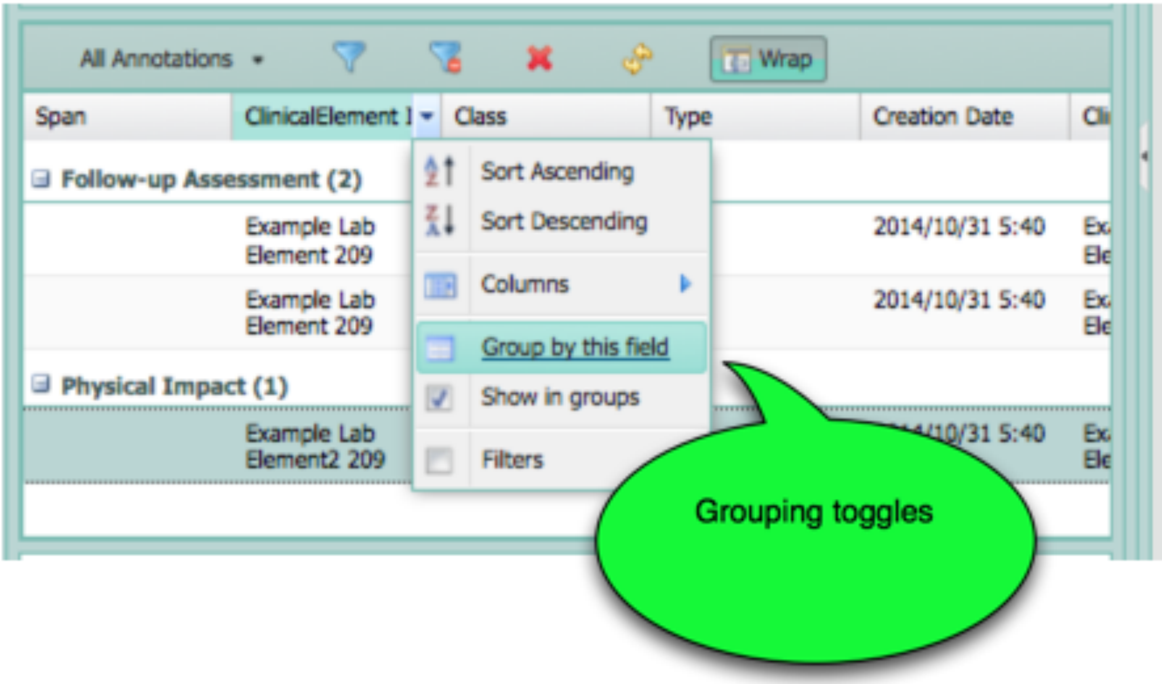


Table 61: Chart Review – List Grouping

Item/Action	Description/Result
Dropdown on Right of Colum -> Group by this Field	Groups the grid list by the specified column. Note: The list can be both grouped and sorted simultaneously.
Dropdown on Right of Column -> Show in groups	Toggles the grouping by the specified column.

3.4.7 Variable Column Order and Size

Figure 67. Chart Review – Variable Column Order and Size

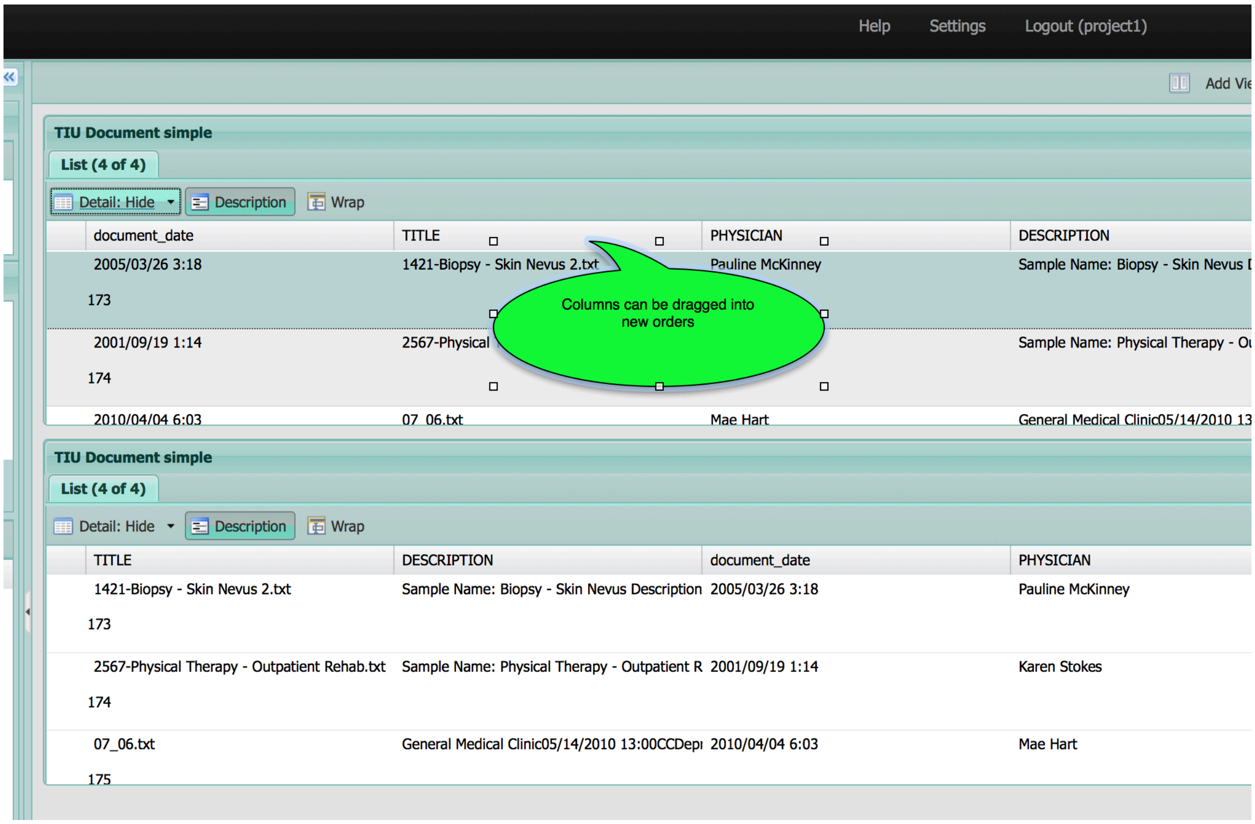


Table 62: Chart Review – Variable Column Order and Size

Item/Action	Description/Result
Drag Column Order/Size	Columns can be reordered by dragging and they can be resized by grabbing the edge of the column headers. These changes persist until the view is closed. Two views of the same type may have different column layouts.

3.4.8 Collapsible Views

Figure 68. Chart Review – Collapsible Views

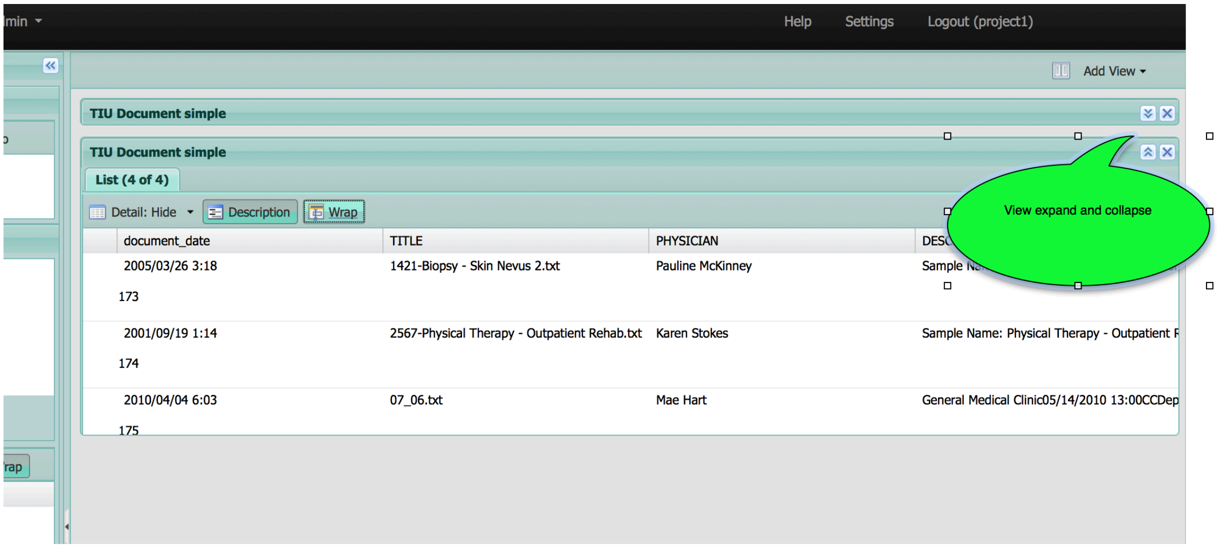


Table 63: Chart Review – Collapsible Views

Item/Action	Description/Result
Collapse/Expand View	Collapses or expands a view.

3.4.9 Delete View

Figure 69. Chart Review – Delete View

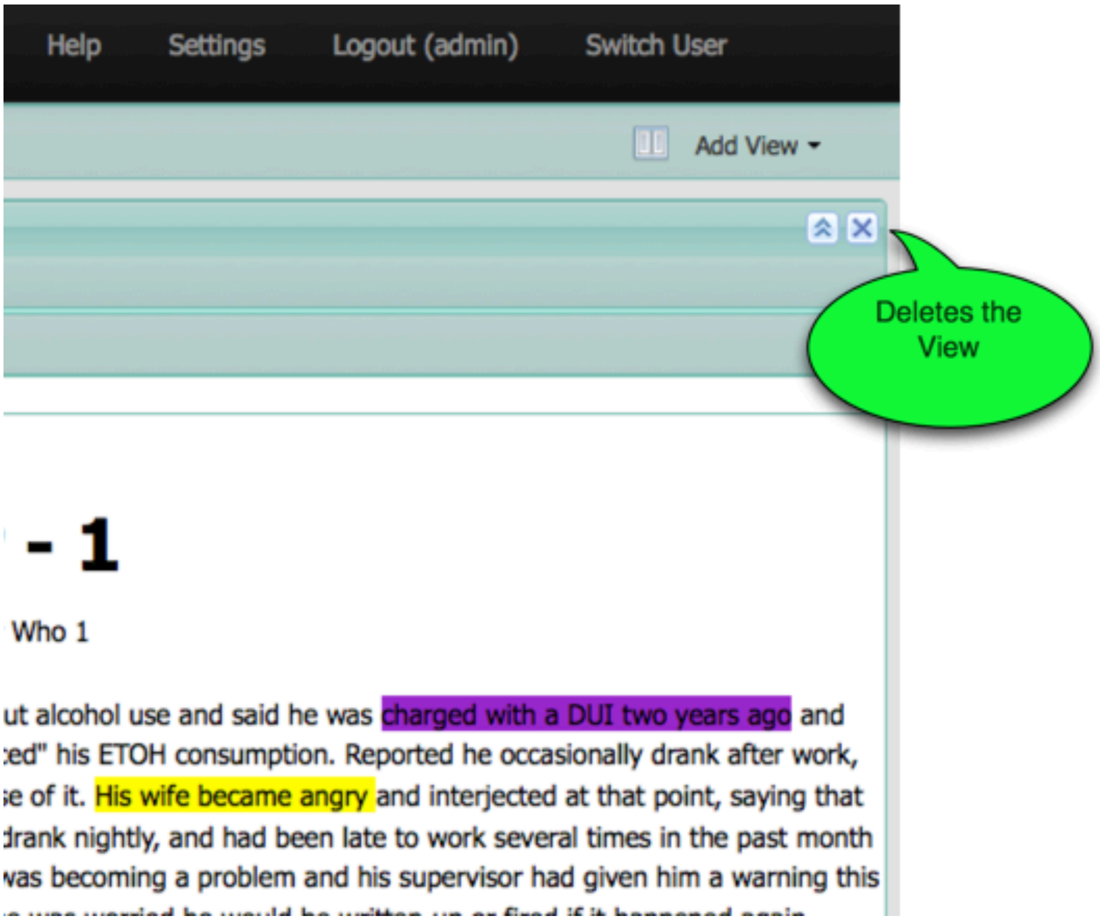


Table 64: Chart Review – Delete Views

Item/Action	Description/Result
Delete View	Deletes the view. Another instance of a view type can be added through the Add View dropdown menu.

3.4.10 Add View

Figure 70. Chart Review – Add View

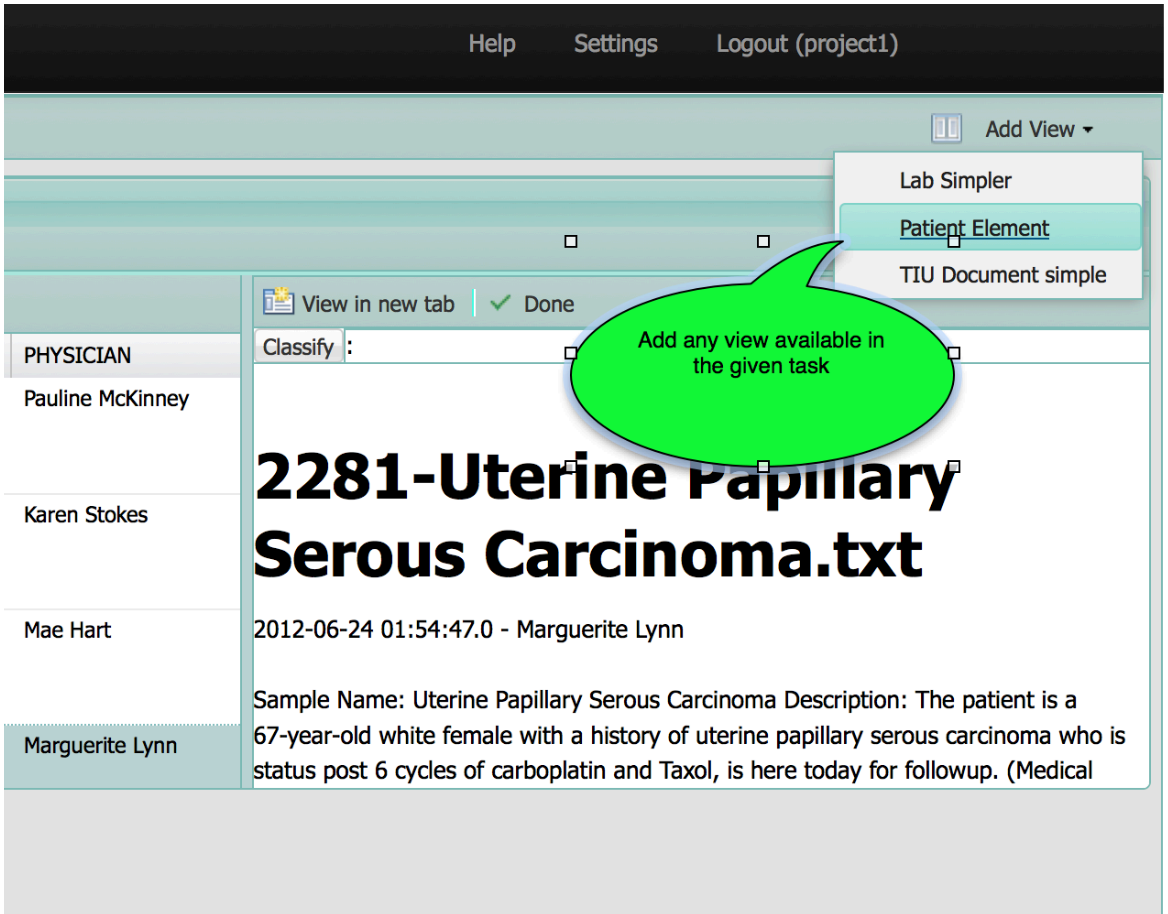


Table 65: Chart Review – Add View

Item/Action	Description/Result
Add View	Adds an instance of the specified view type. Multiple instances of the same view type are allowed.

3.4.11 Multiple Instances of the Same View (comparison) and the Auto-select Toggle

Two instances of the same type of view can be opened simultaneously, affording a comparison capability where the annotation on one document of a given type may be used as a model for annotating another document of a given type, for example.

Note that when an annotation is created on one type of clinical element, all views of that type of clinical element will be auto-selected to show the annotation, unless the Auto-select toggle is OFF. Turn the Auto-select toggle off when comparing two documents of the same clinical element type so that the reference document will not be changed as annotations are added to the second document of that type.

Figure 71. Chart Review – Multiple Instances of the Same View (Comparison)

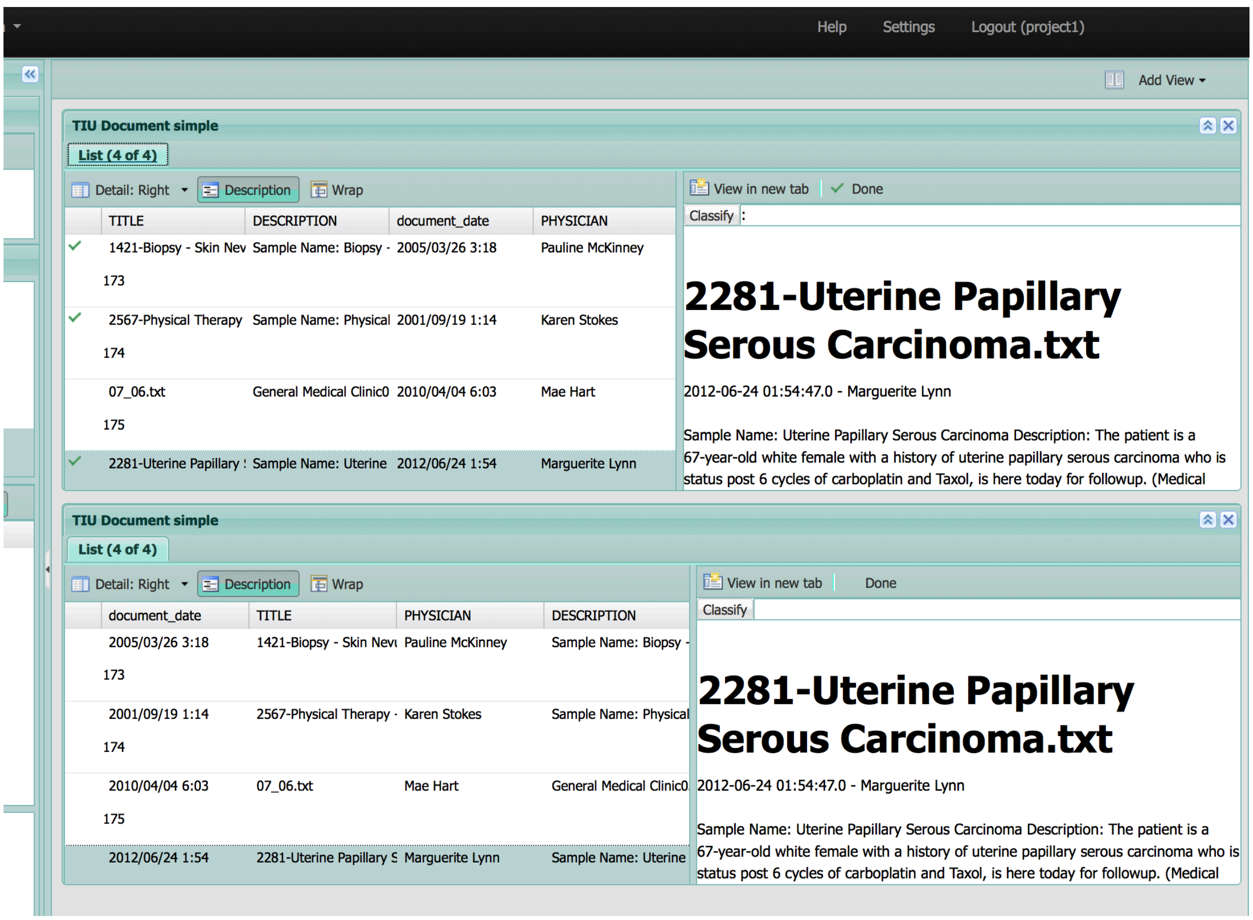
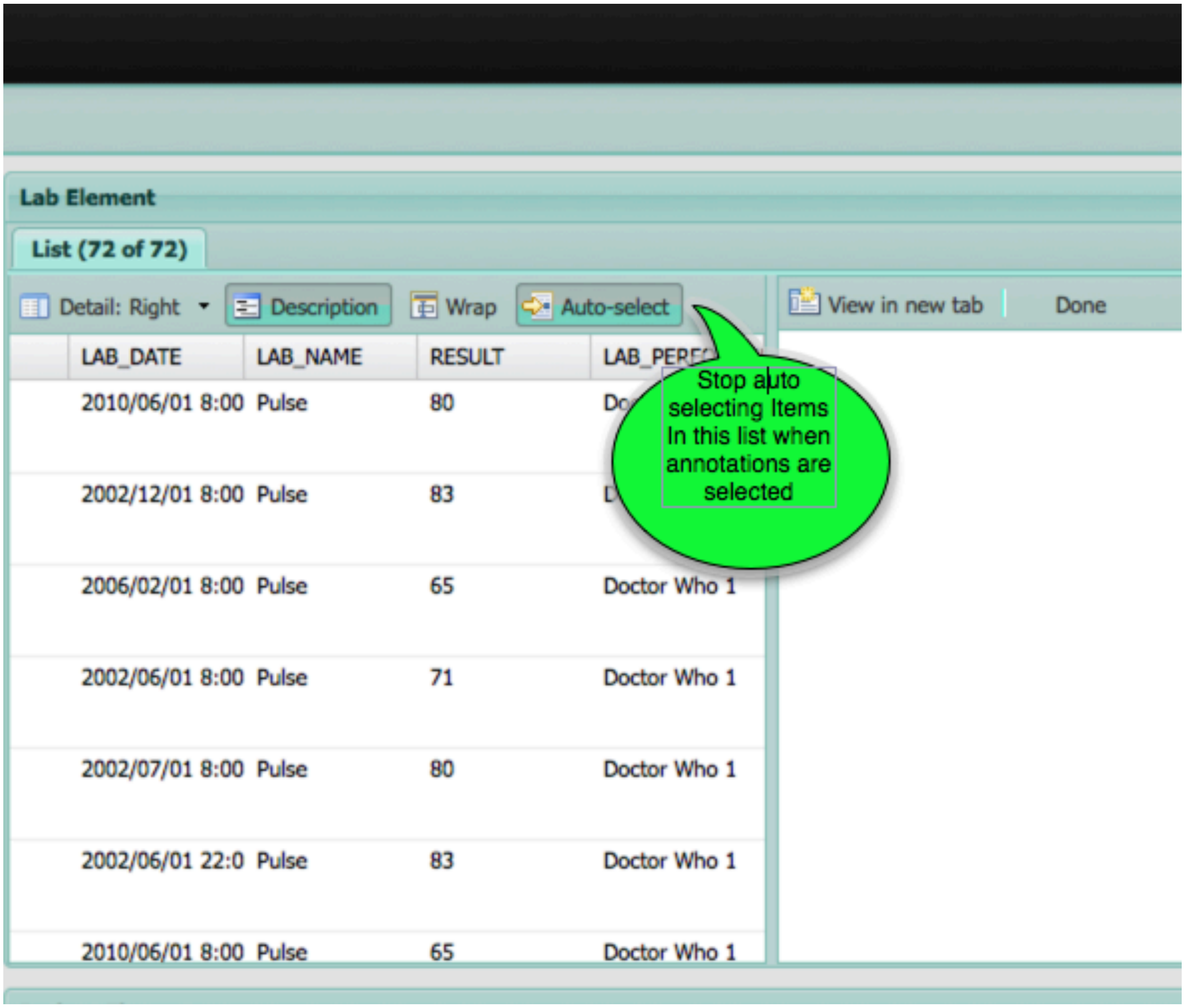


Figure 72. Chart Review – Auto-select Toggle



3.4.12 Closable Annotation Panel

The annotation panel can be collapse if the user wants more room for chart review activities.

Figure 73. Chart Review – Closable Annotation Panel

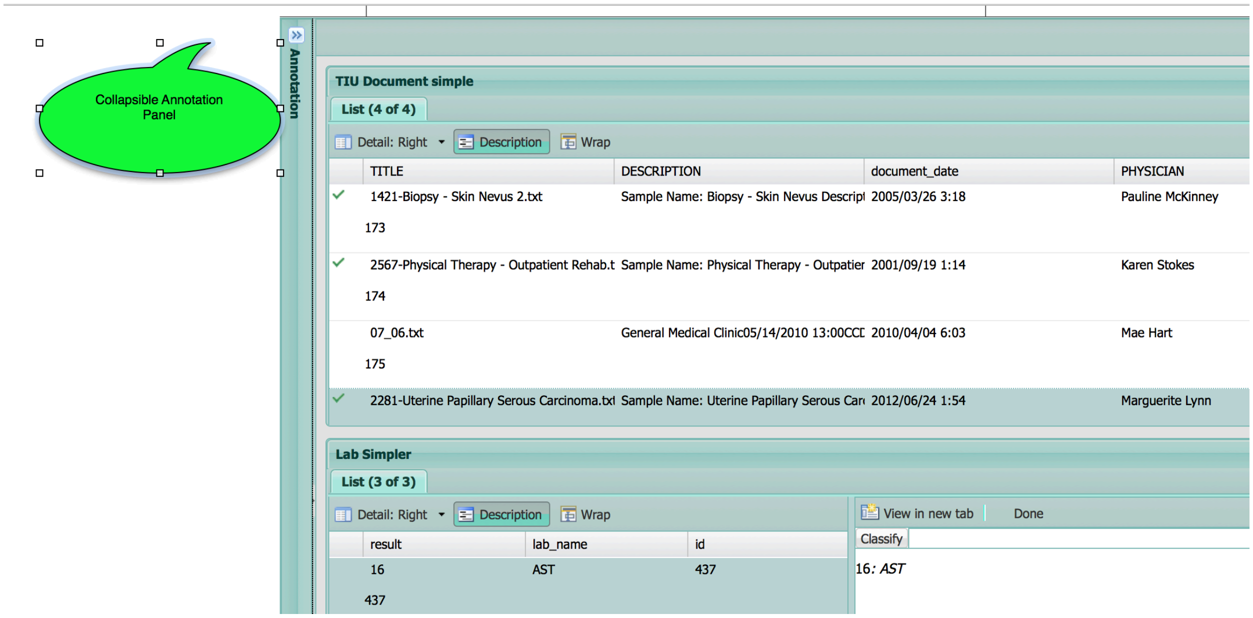


Table 66: Chart Review – Closable Annotation Panel

Item/Action	Description/Result
Collapse Annotation Panel	Collapses/expands the annotation panel.

3.5 Workflow Support

There are several features of the Chart Review interface that support project workflow issues, including saving a detail view as a separate tab to refer to later, and a Done button to keep track of items for which the task has been completed.

3.5.1 View In New Tab

A user can save a detail view as a separate tab so that he may come back to it at a later point.

Note: The column that is displayed as the tab title is specified in the Title Field of the clinical element definition.

Figure 74. Chart Review – View in New Tab

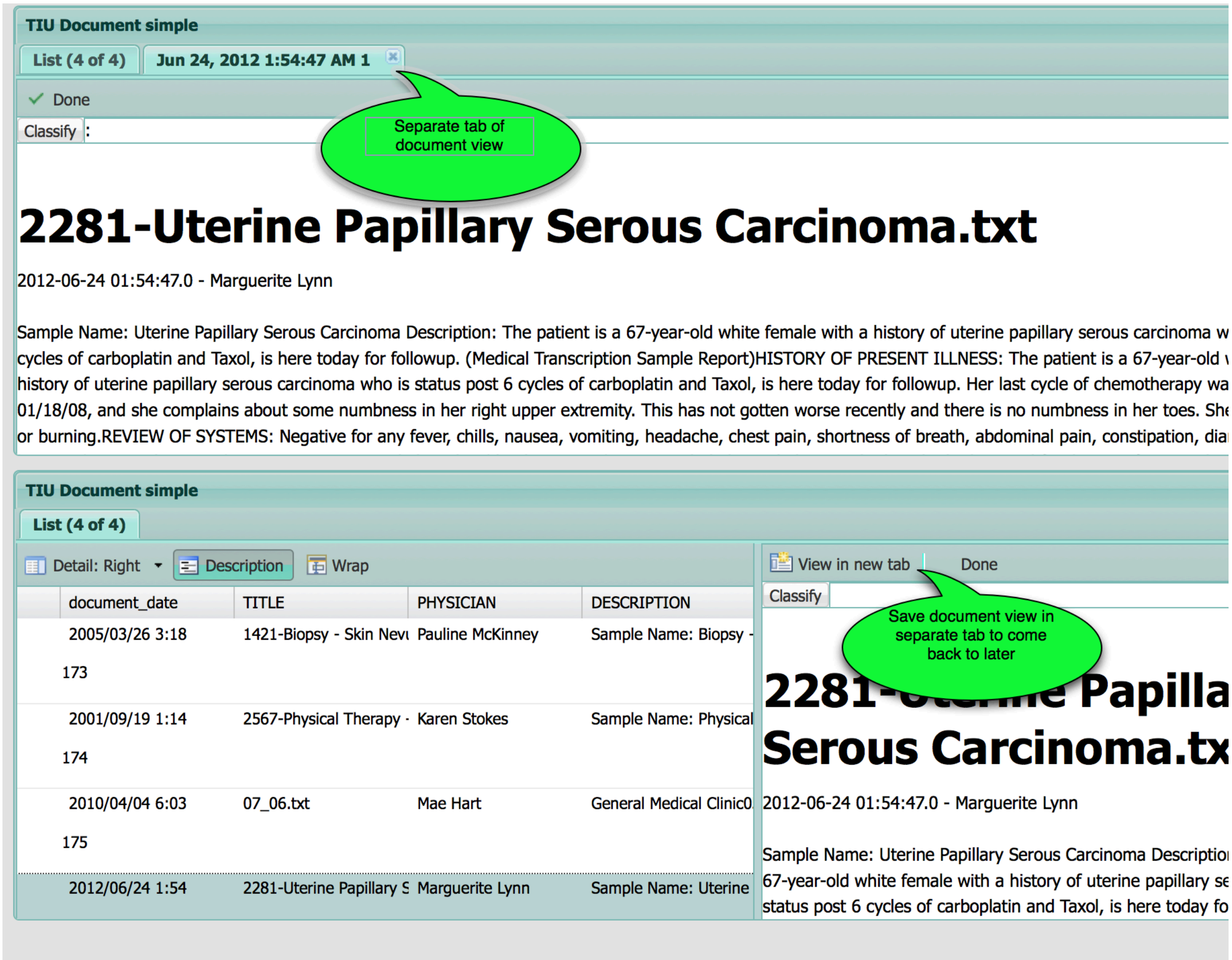


Table 67: Chart Review – View In New Tab

Item/Action	Description/Result
View in new tab	Opens the current detail in a separate tab. Annotations selected in the annotation list will be auto-selected and viewed in a separate tab, if there is a separate tab opened for that clinical element. If there is not a separate tab for that clinical element, the auto-select view will show it in the detail panel as usual.

3.5.2 Marking Records As Done

To help a user keep track of which clinical elements he has already performed the annotation task on, he may mark the element as Done. Clinical elements that are done have a check mark by them in the grid.

Note that the task may be marked as done by pressing the Done button in the Task panel. The task is marked as completed and the user is returned to the Chart Review home page.

Figure 75. Chart Review – Marking Records As Done

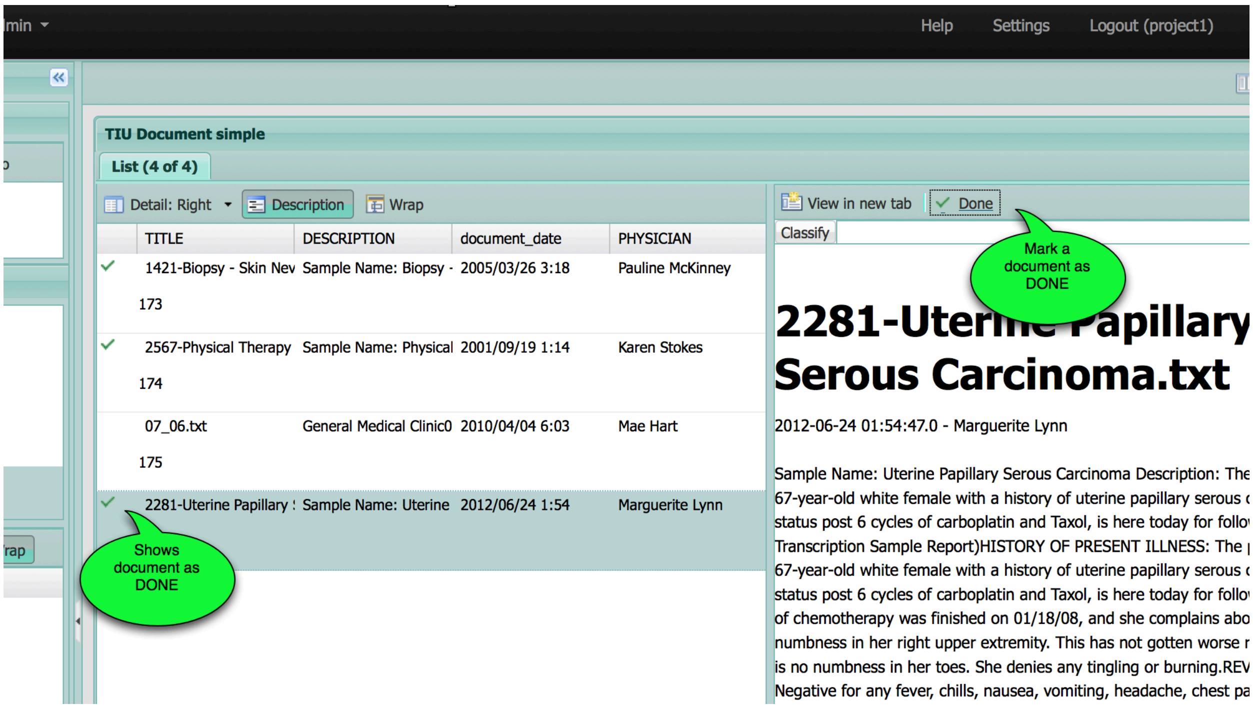


Table 68: Chart Review – Marking records as Done

Item/Action	Description/Result
Done	Toggles the clinical element between done and not done. Done is indicated by a green checkmark in the grid.

3.5.3 Optional Text Wrapping

The user may allow cell text in a clinical element view grid to be wrapped or truncated.

Figure 76. Chart Review – Optional Text Wrapping

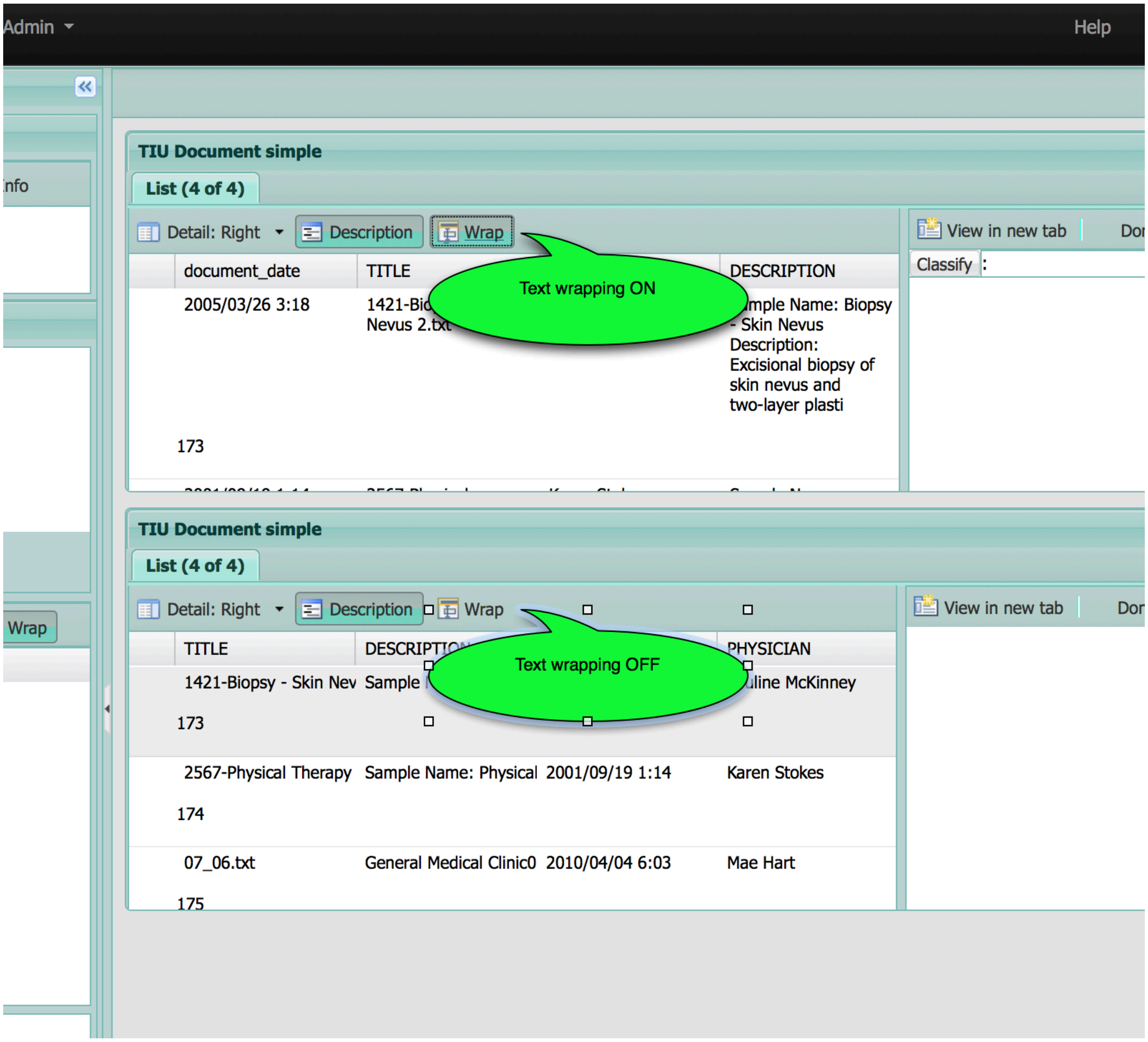


Table 69: Chart Review – Optional Text Wrapping

Item/Action	Description/Result
Wrap	Toggles wrapping of text in the grid cells. If wrapping is off, the text in a cell is truncated. If wrapping is on, cell text is wrapped and the row height is increased.

3.5.4 Description Hiding

Each row of a clinical element view grid may display a description or not by toggling with the Description toggle button.

Note: The column that is displayed as the description is specified in the Description Field of the clinical element definition.

Figure 77. Chart Review – Description Hiding

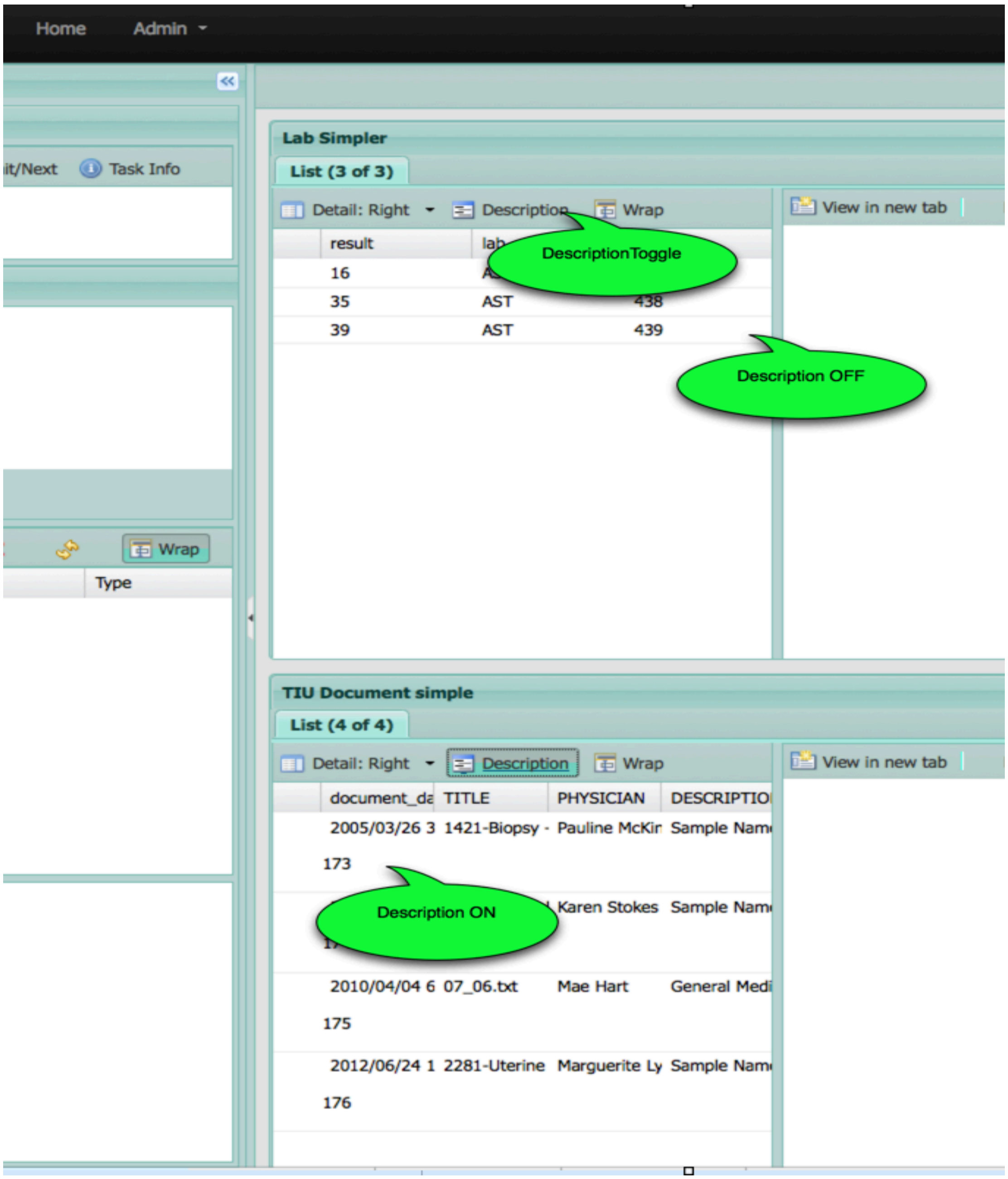


Table 70: Chart Review – Description Hiding

Item/Action	Description/Result
Description	Toggles display of the clinical element description in the grid as a preview.

3.6 Annotation Workflow

All interaction with the task that is being performed in Chart Review is displayed in the Task panel in the upper left part of the application screen, at the top of the Annotation panel. The name of the task is displayed, along with the task id in parenthesis. The task id may help in referencing the task in reports and when choosing the task again from the Chart Review Home page's Your Recent Work list. A user may also view a brief description of the task, or a detailed description of the task to understand the nature of the work he has been assigned. Finally, the user may choose how to change the task status after the task is done being performed.

Figure 78. Chart Review – Task Panel and Toolbar

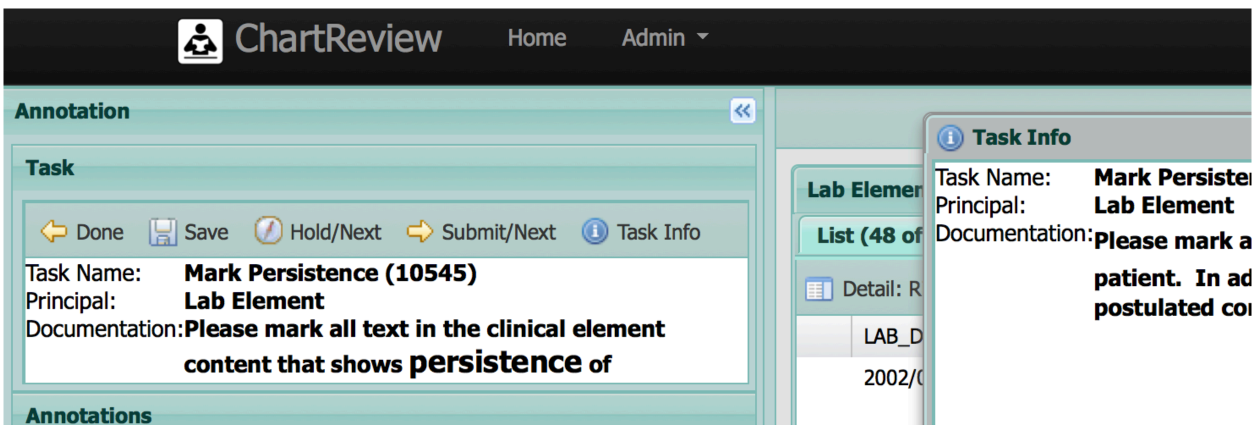


Table 71: Chart Review – Task Panel and Toolbar

Item/Action	Description/Result
Task Name and Task Id	The name of the task and the task id (in parenthesis). Note The task id may help in referencing the task in reports and when choosing the task again from the Chart Review Home page's Your Recent Work list.

Principal	The type of the principal clinical element upon which the task is being performed.
Documentation	A somewhat brief description of the task to be performed. Note: The Task panel is scrollable, allowing the user to view a longer description.
Done	Prompts for save, if needed, and exits Chart Review.
Save	Save annotations, but keeps the current task open.
Hold/Next	Save annotations and submit the task as being on-hold until later. Get the next task assignment.
Submit/Next	Save annotations and submit the task as completed. Get the next task assignment.
Task Info	View the detailed task information. A poup-up window is displayed with task information in it. Press close to close the task information window. Note: If a pdf document, for example, is included in the process task definition as documentation for the task, a separate tab will be opened in the browser to display that document.

3.7 Annotation Schema

The annotation schema associated with the given task is displayed in a collapsible tree in the Annotations schema panel. All classifications available in that schema are displayed and may be selected. To annotate a clinical element text, first select the desired classification and then highlight the text. To annotate a whole clinical element, first select the desired classification and then press the Classify button on the selected clinical element.

Figure 79. Chart Review – Annotation Schema

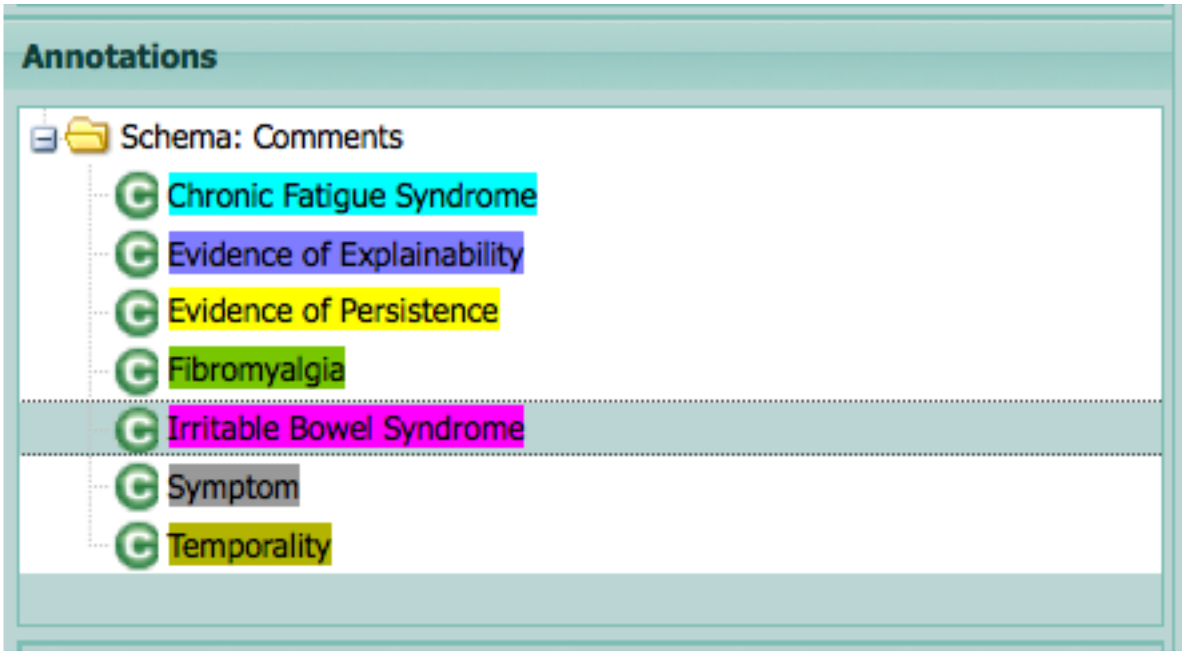


Table 72: Chart Review – Annotation Schema

Item/Action	Description/Result
Select Classification	The currently selected classification will be used in creating annotations on clinical element text and on whole clinical elements. Note: If you try to highlight before picking a classification from the annotation schema, an error message is displayed.

3.8 Annotation of Clinical Element Text

Clinical element text may be annotated by selecting an annotation schema classification in the Schema panel and then highlighting the text with a swipe. Annotation spans may overlap in all combinations of ways. Annotation span colors are blended to show overlaps. An annotation appears in the annotation list for every highlight swipe made in the text. Features for that annotation are displayed and able to be edited in the Annotation Editor panel at the lower left of the screen.

Figure 80. Chart Review – Annotation of Clinical Element Text

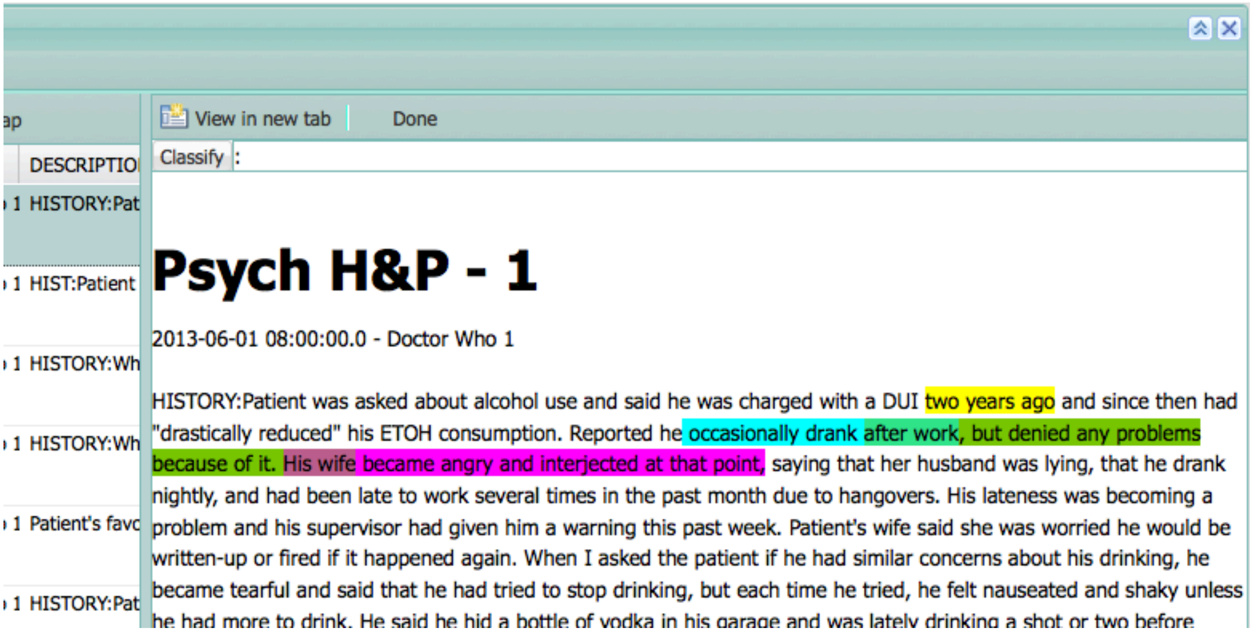


Table 73: Chart Review – Annotation of Clinical Element Text

Item/Action	Description/Result
Highlight	Creates an annotation which is displayed in the list on the left. Note: When you create an annotation by highlighting the text, an annotation will be created in the annotation list and annotation features that need to be filled in will be displayed in the Annotation Editor panel at the bottom left of the screen.
Select Annotation from Text	When you click on an annotation span in the text, the corresponding annotation item will be selected in the Annotation List to the left. Note: A selected annotation is show with black under and over lining in the text.
Select Annotation from List	When you select an annotation in the Annotation List on the left, the clinical element to which the annotation belongs will be opened and the annotation will be scrolled into view and shown as selected. Note: A selected annotation is show with black

	under and over lining in the text.

3.9 Annotation of Whole Context Clinical Element (i.e. Note, Lab)

A whole clinical element may be annotated by selecting a classification in the Schema panel and pressing the Classify button found in the detail area of the clinical element view. A clinical element may have multiple classifications. Each classification is displayed to the right of the Classify button.

Figure 81. Chart Review – Annotation of Whole Clinical Element

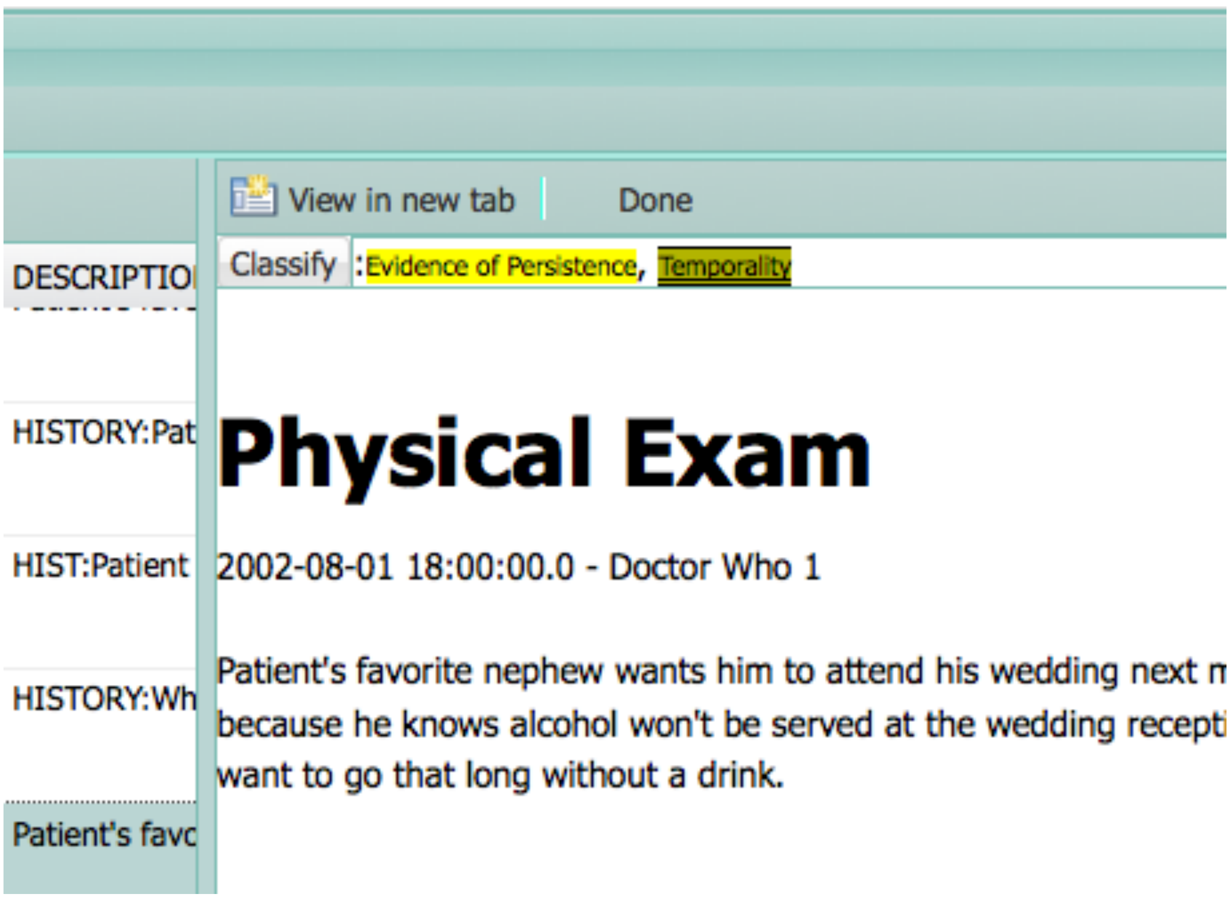


Table 74: Chart Review – Annotation of Clinical Element Text

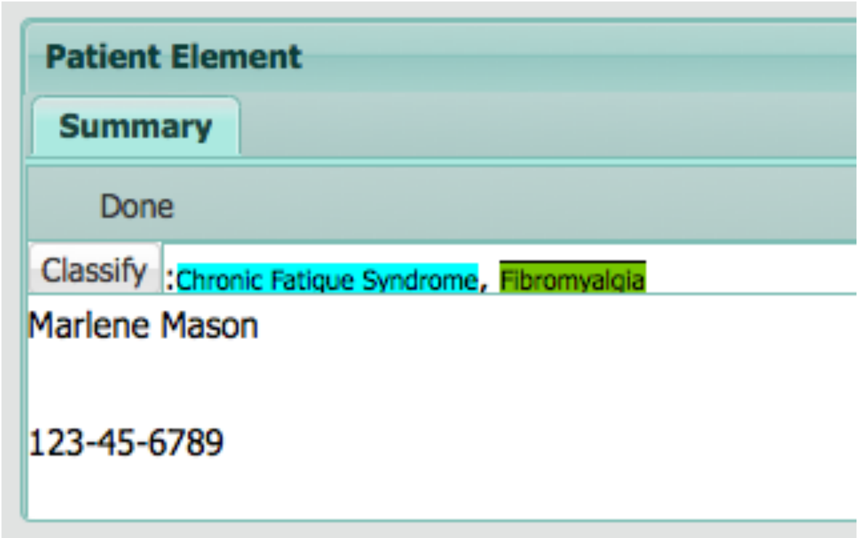
Item/Action	Description/Result
Classify	Creates an annotation for the whole clinical element record which is displayed in the list on the left.

	Note: When you create an annotation by pressing the Classify button, an annotation will be created in the annotation list and annotation features that need to be filled in will be displayed in the Annotation Editor panel at the bottom left of the screen.
Select Annotation from Classify panel	When you click on an annotation classification label in the are next to the Classify button, the corresponding annotation item will be selected in the Annotation List to the left. Note: A selected annotation is show with black under and over lining in the text.
Select Annotation from List	When you select an annotation for a whole clinical element in the Annotation List on the left, the clinical element to which the annotation belongs will be opened and the annotation will be shown as selected. Note: A selected annotation is show with black under and over lining in the text.

3.10 Annotation of Principal Clinical Element (i.e. Patient)

The principal clinical element of a task may be displayed (or not) in a view just like the context clinical elements. It is commonly displayed with a Summary tab rather than with the default grid/detail display because the principal clinical element is only one element (i.e. patient), not a list of elements like may of the context clinical elements. It is annotated in the same way as any other clinical element displayed.

Figure 82. Chart Review – Annotation of Principal Clinical Element



3.11 The Annotation List

All annotations associated with a given task whether they be on the principal clinical element itself or any of the context clinical elements, are displayed in a grid in the Annotation panel. This grid may be grouped, sorted, filtered, and deleted. Selecting annotations in this list will open the corresponding clinical element view (if not already open) and will auto-scroll to the selected annotation. As annotations are created they appear in the list and their features are displayed in the Annotation Editor panel below the list. The grid may be sorted, grouped and filtered by accessing a dropdown menu on the right of the column header.

Figure 83. Chart Review – Annotation List

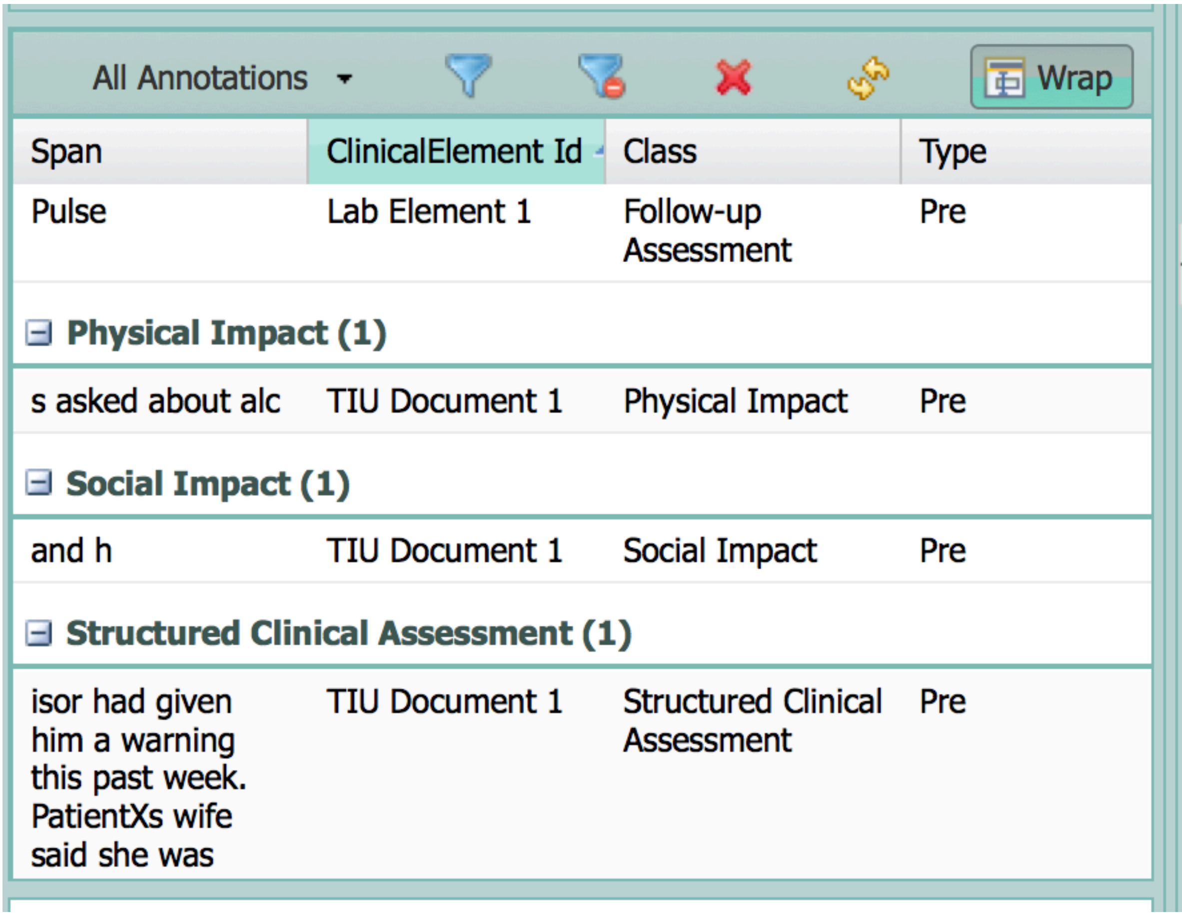


Table 75: Chart Review – Annotation List

Item/Action	Description/Result
All Annotations / Selected Document Annotations	Toggles between showing all annotations belonging to the task (and all of its clinical element documents) and showing only those annotations belonging to the currently selected clinical element document in the views to the right.
Show Column Filters	Shows the current column filters in a popup message.
Clear Column Filters	Clears all column filters.
Delete Selected Annotations	Deletes all currently selected annotations. Unless one of the save buttons is pressed, an unintended delete will not be saved to the

	database. So an unintended delete may be undone by exiting going back to the Chart Review Home page without saving – but, this will not save any other changes as well.
Refresh	Refreshes the annotation grid. The annotation grid may be refreshed to display edits that have been made in the Annotation Editor.
Wrap	Toggles wrapping of text in the grid cells. If wrapping is off, the text in a cell is truncated. If wrapping is on, cell text is wrapped and the row height is increased.

3.12 Editing Annotation Attributes

Annotations have attributes features that may be edited when an annotation is created or modified at a later time. The attributes are displayed in the Annotation Editor panel immediately when an annotation is created or selected. After editing the attributes, you may need to refresh the Annotation list.

Figure 84. Chart Review – Editing Annotation Attributes

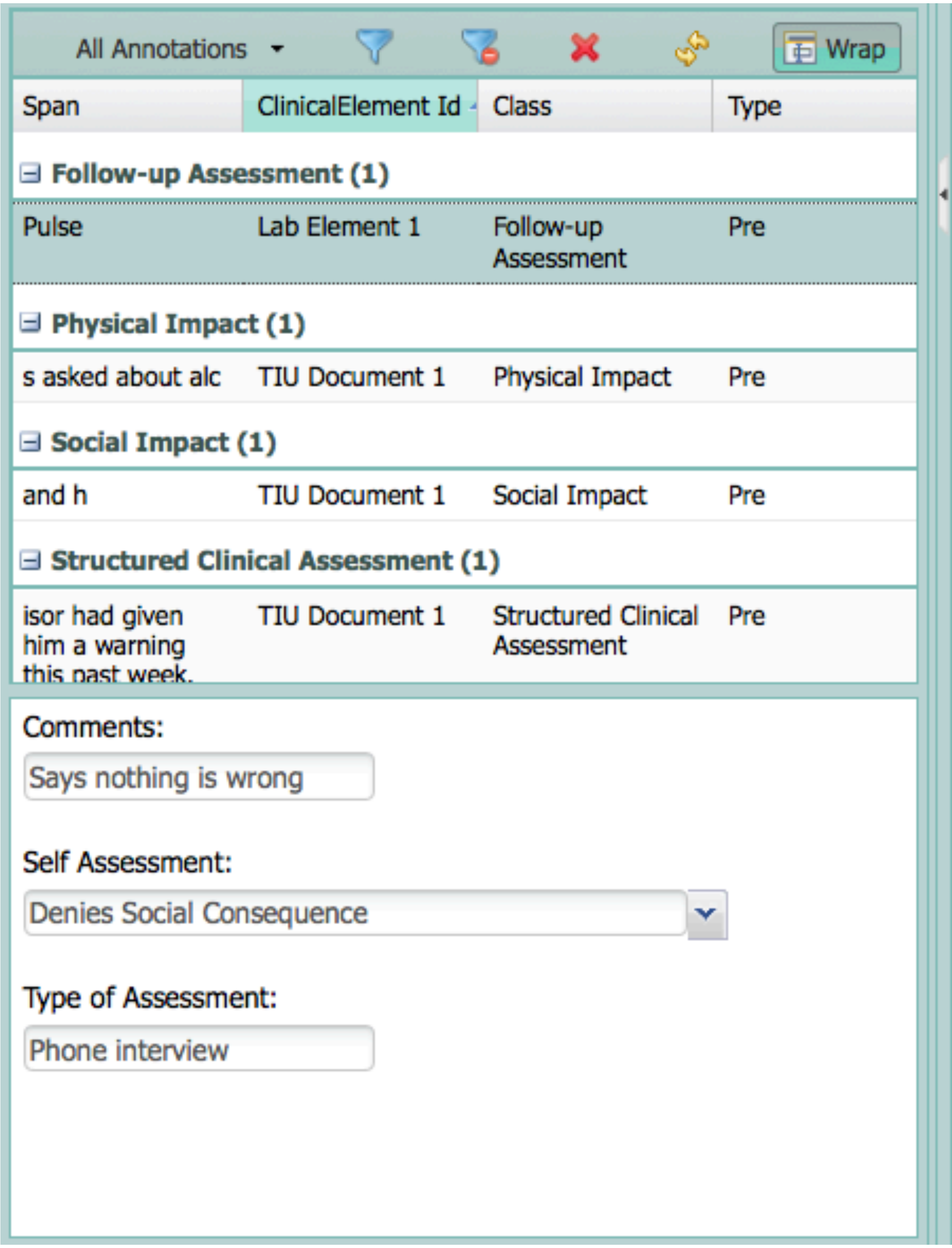


Table 76: Chart Review – Editing Annotation Attributes

Item/Action	Description/Result
Text	Text attributes may be edited by entering text in a simple text field.
Numeric	Numeric attributes may be edited by entering a valid number in a simple text field. If the number is out of range, an indication of the invalid state of the field will be indicated with a red border and a popup stating what is invalid.
Date	Date attributes may be edited by entering a valid date in a simple text field or by picking a date from a date picker. If the date is out of range, an indication of the invalid state of the field will be indicated with a red border and a popup stating what is invalid.
Option	Option attributes may be edited by choosing an option from the dropdown menu.

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