Unit 1: Introducing the Course

About the Course

ExtJS 5 Step-By-Step is an instructor-led course designed to introduce you to the fundamental concepts of building cross-browser compatible mobile and desktop apps using Sencha Ext JS 5.x.

The course is designed to be followed in sequence. Solutions are provided for each exercise to help you if you get "stuck" on a particular step.

Prior to starting the class you must configure your workstation as described in Appendix A. Using OS/X is preferred for building mobile apps, however, this courseware is also compatible with Microsoft Windows.

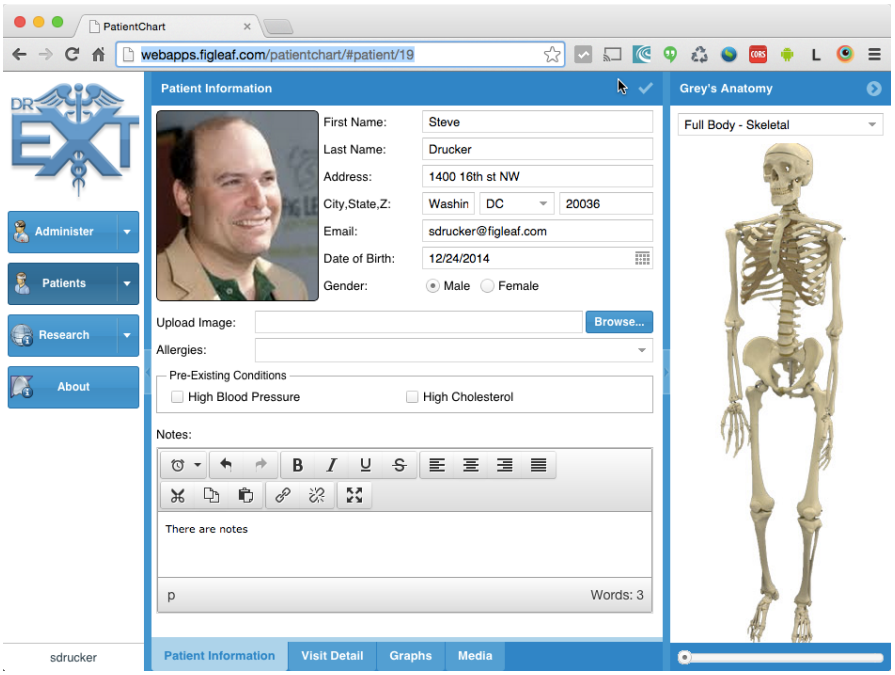

Figure 1: Dr. Ext

Over the next 5-8 days you will build "Doctor Ext", depicted in Figure 1, a complex rich internet app (RIA) for both the desktop and tablet that illustrates key concepts in enterprise Ext JS 5 development.

About the Authors

Fig Leaf Software is an award-winning team of imaginative designers, innovative developers, approachable instructors, and insightful strategists.

For over 20 years, we've helped a diverse range of clients with needs across the entire spectrum of web-related services, including design, marketing and content strategies, custom software development, product licensing and personalized training.

Located in the heart of Washington, DC, we're a Certified Service-Disabled Veteran-Owned Small Business (SD-VOSB) with a keen ability to understand your needs, a broad array of strategic Partners, and a talented team eager to make your latest web initiative a resounding success.

Fig Leaf maintains close partnerships with Sencha, Adobe, Google, Acquia, Ektron, and other thought-leaders in web application development and web content management.

Check us out at http://www.figleaf.com and http://training.figleaf.com.

You can view some of our apps at the following URLs:

- Archdiocese of Baltimore Mobile (Sencha Touch and PhoneGap) https://itunes.apple.com/us/app/archdiocese-of-baltimore/id561046247?mt=8
- NACCHO Model Practices (Ext JS 4) http://www.naccho.org/topics/modelpractices/search.cfm
- NACCHO Toolbox (Ext JS 4) http://www.naccho.org/toolbox/

Whether you need strategic consulting, best practice guidance, or products and training for real-world solutions, We've Got You Covered.

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About Steve Drucker

Steve Drucker served as the course architect and lead author for Ext JS 5 Step-By-Step. Throughout his twenty year career in I.T., Steve has authored over a dozen instructor-led courses for Sencha, Adobe, and others including Sencha's official courseware - Fast Track to Ext JS 4 and Fast Track to Sencha Touch. Steve holds a Certified Technical Trainer (CTT+) credential and is a Sencha certified instructor. He is also an Adobe certified instructor for ColdFusion, Dreamweaver, Acrobat, LiveCycle, and Connect. He has consulted on over a hundred different production apps throughout his career, authoring apps for Verizon, The Voice of America, The Architect of the Capitol, The National Park Service, and Quest Diagnostics. Steve currently has several Sencha Touch apps available on the App Store and Google Play. Steve holds a B.S. in Computer Science from The University of Maryland, College Park.

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Reviewing the Course Objectives

After completing this course, you should be able to:

- Rapidly develop applications for multiple browsers, form factors, screen resolutions, and devices.
- Load data from remote servers.
- Output structured data into different views- including grids, trees, charts, custom markup, and tab-based forms.
- Render and manipulate PDF and image file assets.
- Efficiently handle user interactions.
- Implement drag & drop interfaces.
- Persist user settings between sessions.
- Theme your applications with custom icons, colors, and backgrounds.
- Use responsive configurations to change the layout of your application based on form factor.
- Create optimized production builds of your apps.
- Create and run automated test scripts to identify bugs in your app.
- Generate world-class searchable and cross-indexed documentation for your source code.

Reviewing the Course Prerequisites

The knowledge prerequisites for this course are:

- Prior experience with HTML.
- Intermediate understanding of CSS.
- Intermediate JavaScript coding skills
- Familiarity with JavaScript Object Notation (JSON)
- Basic understanding of Object Oriented Programming (OOP)

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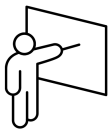
Reviewing the Course Format

This course is divided into several units, each of which presents new information and may contain demonstrations, walkthroughs, and a labs. At the end of each unit, you will find a summary and a short review to test your knowledge of the unit's content.

The following icons are used throughout the guide:



Concepts introduce new information and illustrate coding syntax and best practices.

Walkthroughs guide you through procedures in a hands-on context

Labs let you practice new skills on your own.

Summaries provide a brief synopsis of the unit's content.

Reviews test how well you remember the concepts from the unit.

Best Practices provide you with helpful insights and information.

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Outlining the Course Content

Unit 1: Introducing the Course

Unit 2: Introducing Ext JS 5

- Implementing the 3-tier architecture
- Reviewing features and capabilities
- Reviewing the Ext JS examples
- Introducing MVC and MVVM
- Introducing the Class System
- Generating App Scaffolding with Sencha Cmd
- Using the API Docs
- Debugging and troubleshooting your app
- Getting Help from the Sencha Network

Unit 3: Defining Views

- Deep-Diving into the Class System
- Working with DOM Elements vs. Ext Components
- Using the Component Hierarchy
- Instantiating a Viewport
- Using the Border Layout
- Defining Panels
- Defining Toolbars, Buttons, and Menus
- Handling User Events with ViewControllers
- Working with Tab Panels
- Supporting the “back” button with Routes
- Working with Windows
- Implementing a Dashboard

Unit 4: Reading Complex Data from an App Server

- Understanding AJAX and REST
- Implementing View Models and Data Binding
- Implementing Roles-Based Security
- Defining a Data Model
- Defining a Proxy
- Reading Multiple Records into a Data Store
- Using Chained Stores

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Unit 5: Visualizing Tabular Data in Grids

- Defining a Grid
- Using Grid Widgets
- Implementing Data Pagination
- Defining Grouped Grids
- Enhancing Grouped Grids
- Editing Data in Grids

Unit 6: Generating Markup from Data

- Working with XTemplates
- Looping Through Data
- Implementing Conditional Processing
- Executing Inline JavaScript
- Binding Custom JavaScript Methods to XTemplates
- Performing Basic Calculations in an XTemplate
- Binding a Template to a Component
- Using the DataView

Unit 7: Visualizing Hierarchical Data in Trees

- Introducing the TreeStore
- Understanding the NodeInterface Class
- Implementing a Tree Panel
- Implementing a Tree Grid
- Working with Heterogeneous Node Types
- Using Trees as an Input Mechanism

Unit 8: Visualizing Data in Charts

- Instantiating a Chart
- Configuring Chart Axes
- Configuring Chart Labels
- Configuring Chart Legends
- Using Chart Interactions
- Working with Bar Charts
- Working with Line Charts
- Working with Gauges

Unit 9: Maintaining State

- Configuring the State Provider
- Saving the State of Components
- Adding State Management to Non-Stateful Components

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Unit 10: Creating Data Entry Forms

- Creating Data Entry Forms
- Defining a Form
- Configuring Form Fields
- Using the Combo Box Field
- Sizing Fields with the Anchor Layout
- Sizing Fields with the Form Layout
- Assigning Default Configuration Values
- Grouping Fields
- Validating Input Data
- Formatting the Data Validation Error Messages
- Submitting Data to the Server for Processing
- Binding Grids to Forms

Unit 11: Theming your App

- Using the built-in themes
- Creating a Theme Package
- Introducing Sass & Compass
- Configuring Sass Variables
- Using Sass Mixins
- Using Responsive Configs

Unit 12: Going into Production

- Documenting your App with JSDuck
- Unit Testing with Jasmine and Siesta
- Generating Testing and Production Builds

Unit 13: Special Topics in Ext JS 5

- Overriding a component
- Working with Elements

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Reviewing the App

Dr. Ext is a physician-themed desktop/tablet application that is comprised of three major sections, or “perspectives:”

- The “Administer” perspective enables the user to edit database tables via grid-based interfaces. The information entered through these grids are used to populate the forms in other perspectives.
- The “Patients” perspective enables the user to enter and review data regarding a patient's history.
- The “Research” perspective enables the user to search the National Institutes of Health database of clinical trials as well as compare and contrast the average insurance reimbursement for various diagnosis at hospitals around the country.

The Administer Perspective

The Administer Perspective, illustrated in figure 2, features a series of draggable windows containing editable grids that enable you to create/read/update/delete data in “lookup” tables. It also contains an editable drag & drop tree that allows you to manage user accounts and groups.

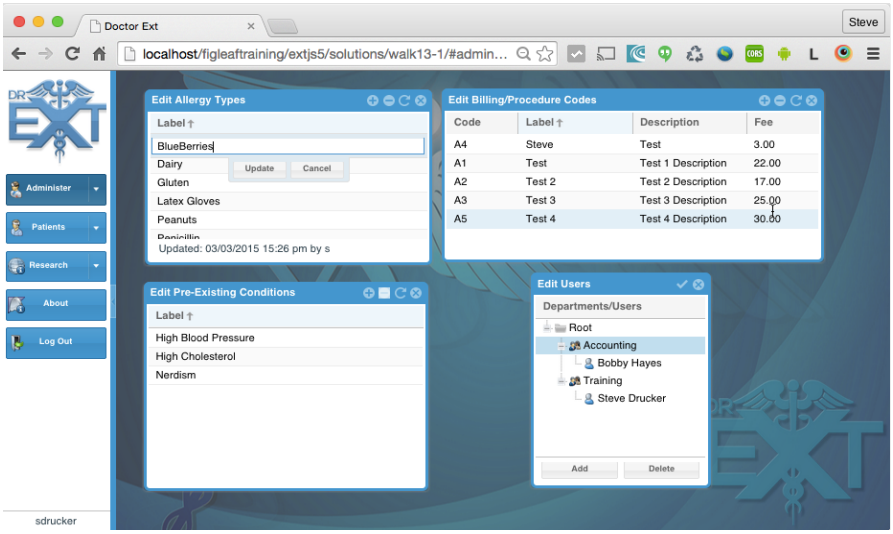

Figure 2: The Administer Perspective

Metadata regarding changes to records, including the update date and the user account that committed the changes are noted at the bottom of each grid.

The Patient Perspective

The Patient perspective, illustrated by Figure 3, is a tab-based interface consisting of the following features:

- Edit contact information about a patient.
- Log information about visits to the doctor's office.
- Display a dashboard containing basic health metrics about the patient.
- Review and analyze x-rays (PNG) files as well as output PDF files.
- Display and rotate basic anatomical structures.

Editing Patient Information

The Patient Information tab is a data entry form that utilizes commonly used input fields. At the bottom of the form is an instance of the TinyMCE 4 WYSIWYG editor which was deployed by integrating an Ext component developed by a 3rd-party.

The rotating anatomy view illustrates how to construct a custom Ext JS component.

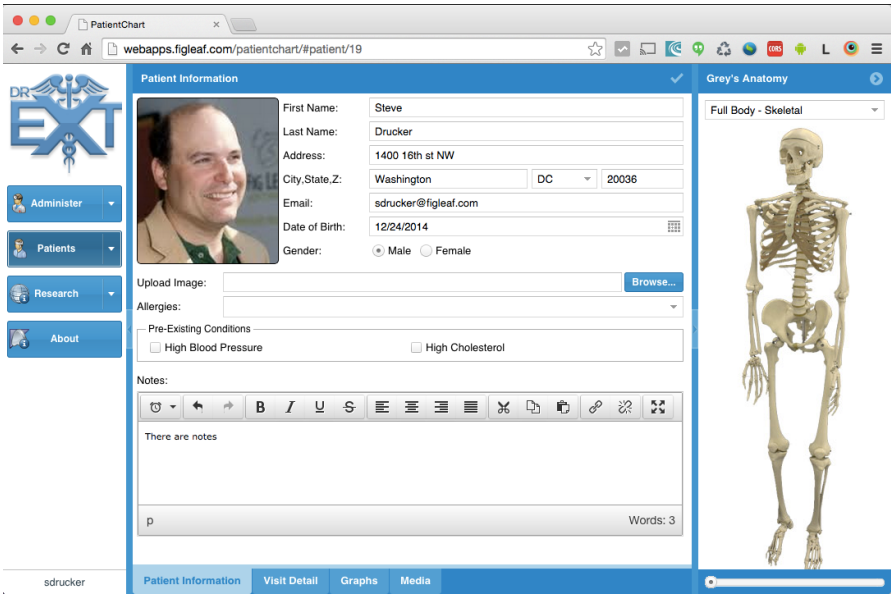

Figure 3: The Patient Perspective

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Editing Patient Visits & Procedures

The Patient Visits & Procedures tab, as illustrated by Figure 4, illustrates key techniques for binding grid data to a form.

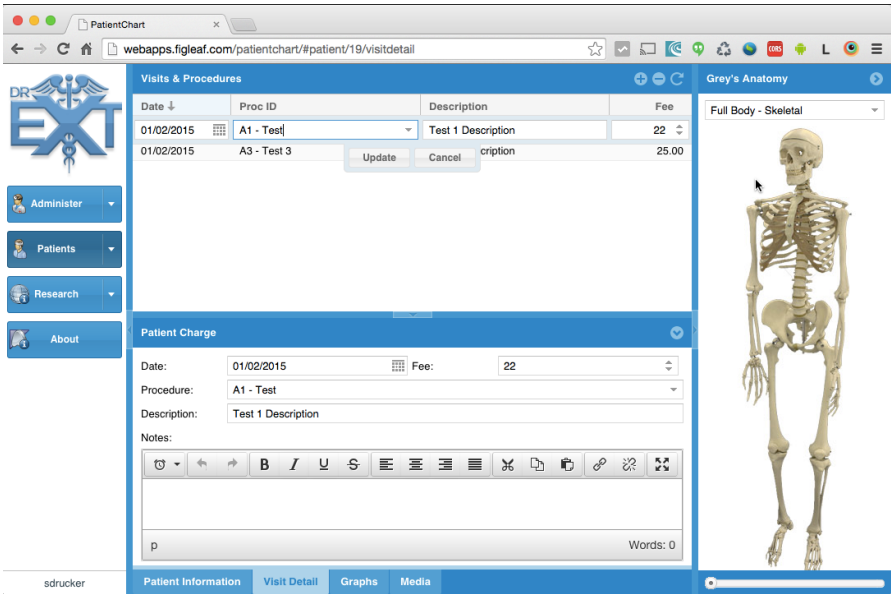

Figure 4: Patient Visits & Procedures

Reviewing the Patient Dashboard

The Patient Dashboard, illustrated in Figure 5, visually represents a series of patient health metrics in a drag & drop dashboard. You'll gain experience with binding grid data to charts and incorporate exciting chart interactions.

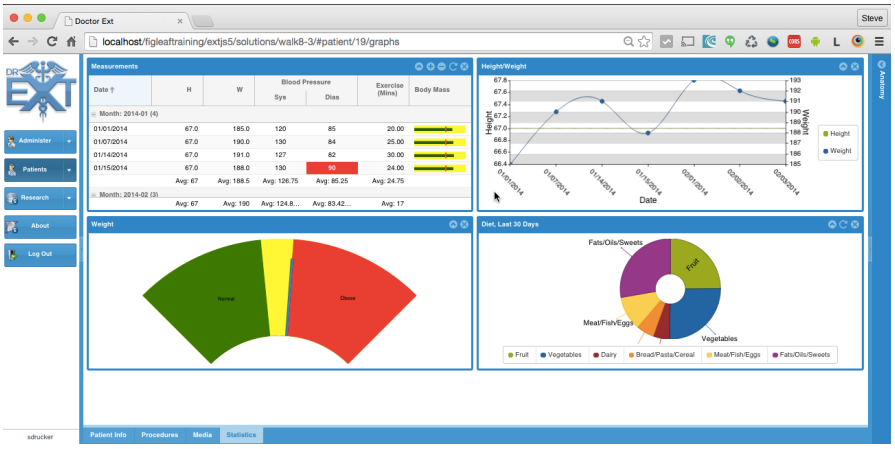

Figure 5: The Patient Statistical Dashboard

Patient Media

The Patient Media tab is comprised of an Dataview component, rendering radiographic images of patients as well as screenshots of the first page of Adobe PDF files. Double-clicking on any of the representative images opens the document in a new tab.

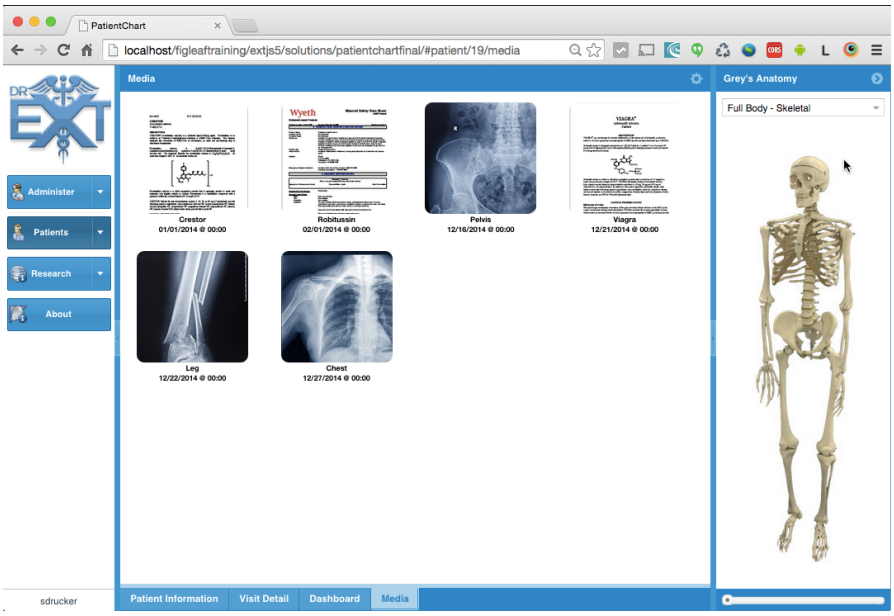

Figure 6: Patient Media

The image analysis tool, illustrated in Figure 7, is a customized third-party Ext JS extension that displays an image in a panel, allowing the user to perform zoom, fit to page, rotation, and measuring operations.

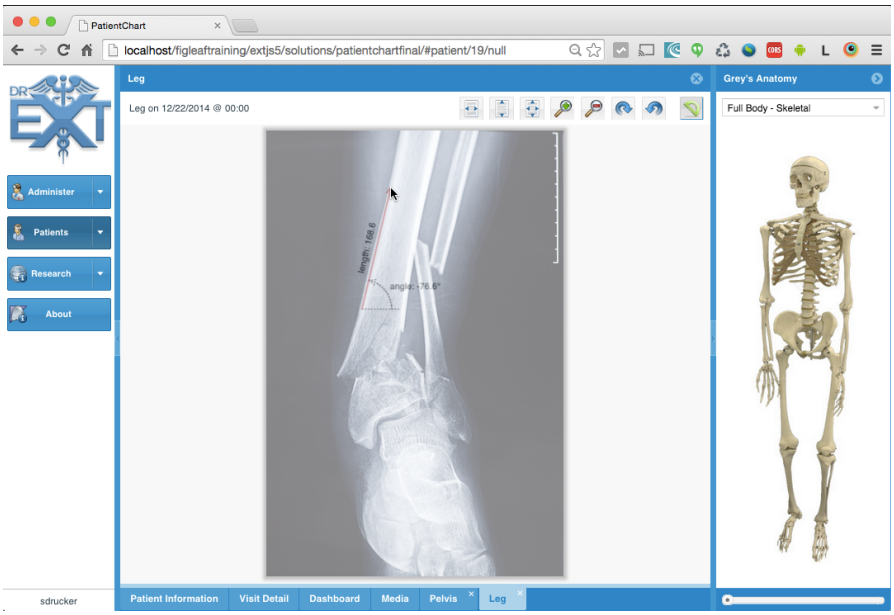

Figure 7: Image Analysis

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The PDF Viewer, depicted in Figure 8, is a customized third-party Ext JS extension that leverages the PDF.js library. It reads a PDF file and converts it into a series of images that are generated from an HTML5 <canvas> element, thereby providing a browser plugin-free method for integrating this commonly used file format.

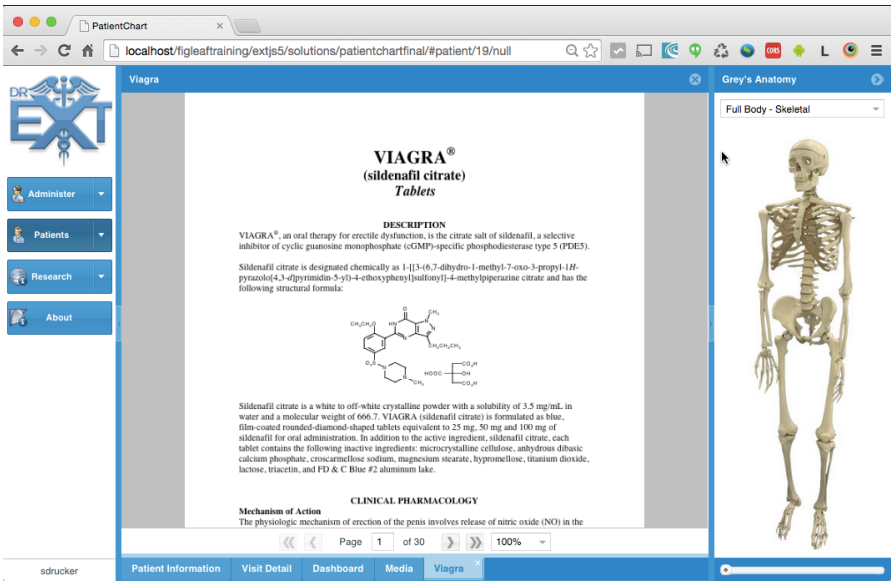

Figure 8: PDF Viewer

The Research Perspective Views

The Research Perspective was designed to teach you how to handle large datasets with great efficiency.

The Clinical Trials window uses an Ext JS "Buffered Store" to allow a user to quickly and gracefully scan through nearly 200K data records supplied by an API run by the National Institutes of Health (https://clinicaltrials.gov/)

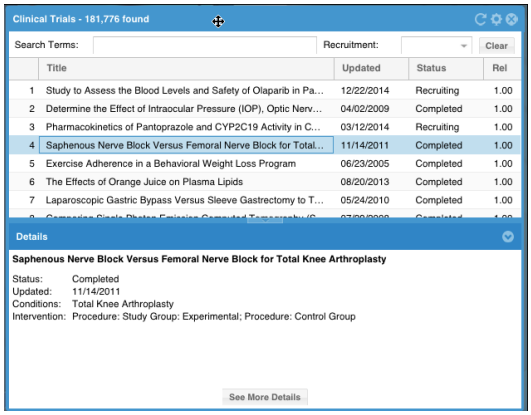

Figure 9: The Clinical Trials Query-By-Example View

The Hospital Inpatient Statistics view, depicted in figure 10, uses a series of tree controls to enable a user to select from the more than 3,000 U.S. hospitals that receive Medicare Inpatient Prospective Payment System (IPPS) payments for the top 100 most frequently billed discharges, paid under Medicare based on a rate per discharge using the Medicare Severity Diagnosis Related Group (MS-DRG) for Fiscal Year (FY) 2011. These DRGs represent more than 7 million discharges or 60 percent of total Medicare IPPS discharges.

Data is output into a grid with data grouped by diagnosis. An Ext JS grid plugin automatically computes average, sum, min, and max values for hospitals in each grouping.

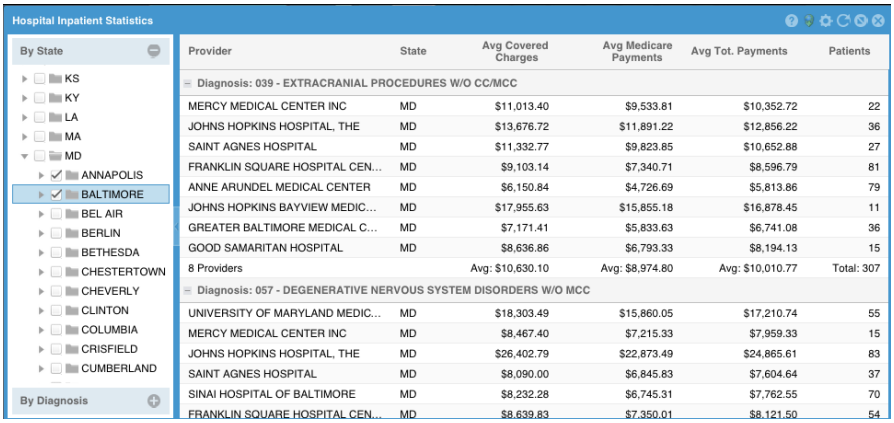

Figure 10: Hospital Inpatient Statistics

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Unit Summary

- The course is presented through a combination of exposition and exercises.
- The course has been designed assuming that you already understand JavaScript, Javascript Object Notation, and the basics of web application development.
- The course consists of thirteen (13) units.
- The course focuses on developing enterprise-ready web applications that are compatible across a broad spectrum of browsers and devices.
- You will build a medical app that runs on a variety of devices and form factors.
- You will learn the fundamentals of rapidly developing high-quality, interactive applications using the Sencha platform.

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