Memorial Sloan Kettering Cancer Center

# Using Drupal to create a digital patient education experience at Memorial Sloan Kettering Cancer Center (MSK)

**Kermitt Ramirez**
**Jacob Rockowitz**

**www.mskcc.org/pe**

# About Us

**Kermitt Ramirez**

*@silentkerm*

- Web Specialist for the Department of Patient and Caregiver Engagement at MSK
- MSK employee since 2007

**Jacob Rockowitz (Big Blue House)**

*@jrockowitz*

- Drupal developer and software architect
- Maintainer for the Drupal 8 Webform module
- Consultant for MSK since 1999

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# Today's Session

## Goals

Provide a history of MSK's transition from analog educational resources to dynamically generated, multilingual PDFs

Explore various technologies used and methods applied to create a digital patient education experience for patients and caregivers and an admin UI/UX for health education content editors

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# History

# History

## Patient and Caregiver Education

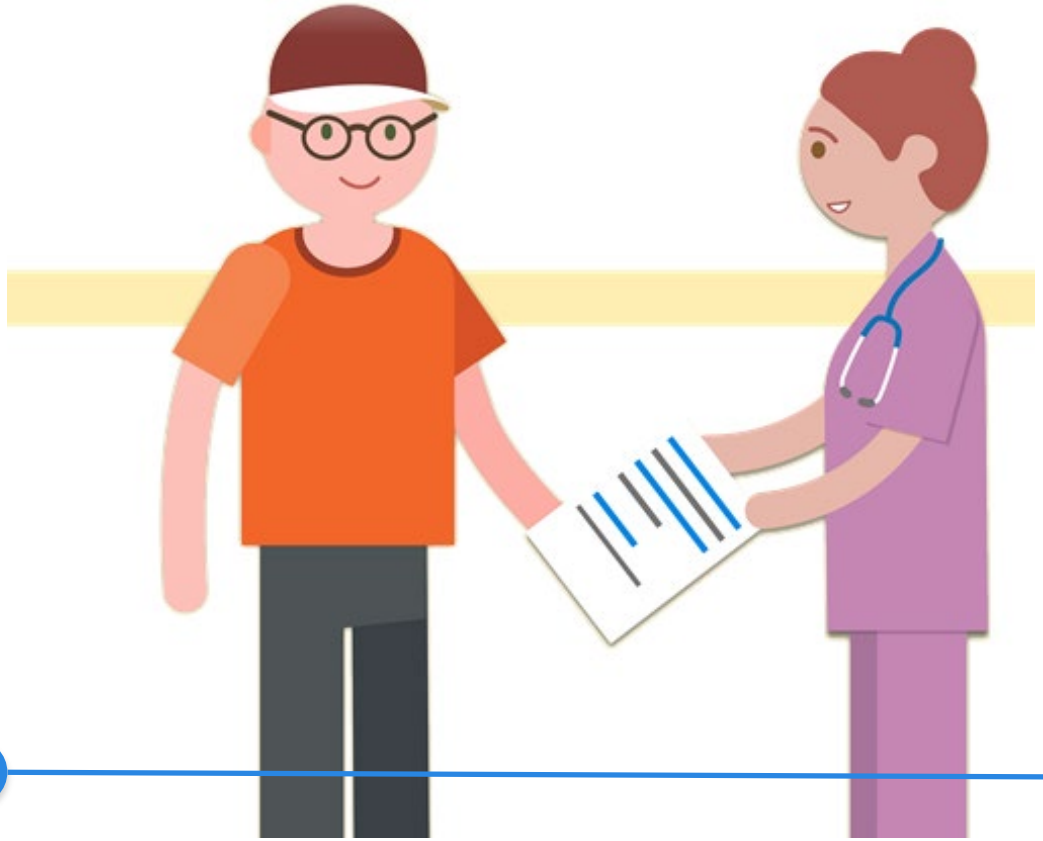
At MSK, the Department of Patient and Caregiver Engagement is dedicated to communicating and engaging with cancer patients, their caregivers, and the public.

Our Patient and Caregiver Education Program collaborates with healthcare professionals to provide accurate, clear, and reliable educational resources to the global community.

# History

## Patient and Caregiver Education

"Fact cards" and DVDs for patients and caregivers were made available to order and distributed by clinicians



# History

## Patient and Caregiver Education

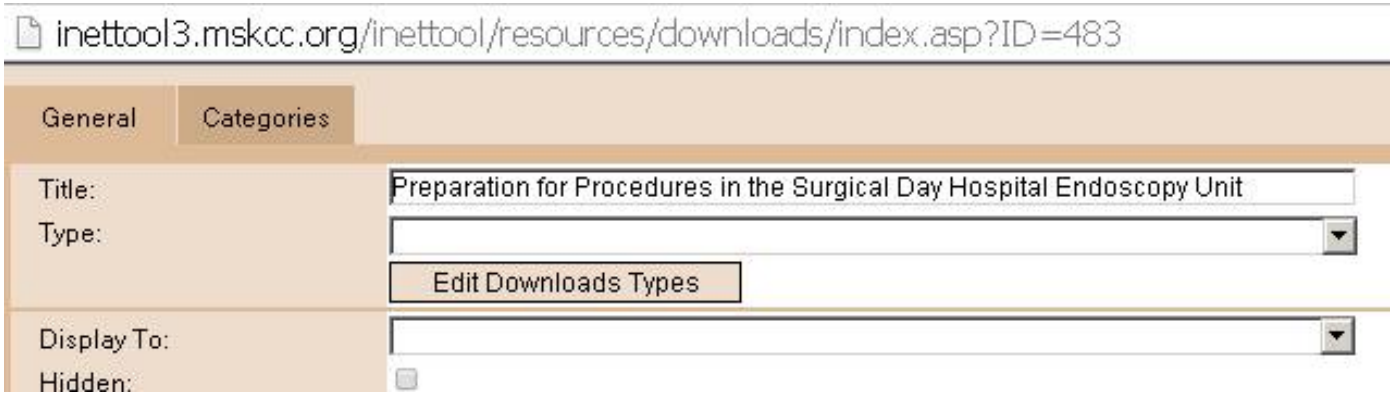
Goal was to make all of our resources available online

# History

## Patient and Caregiver Education

Partnered with Jacob Rockowitz for development of the Inettool.

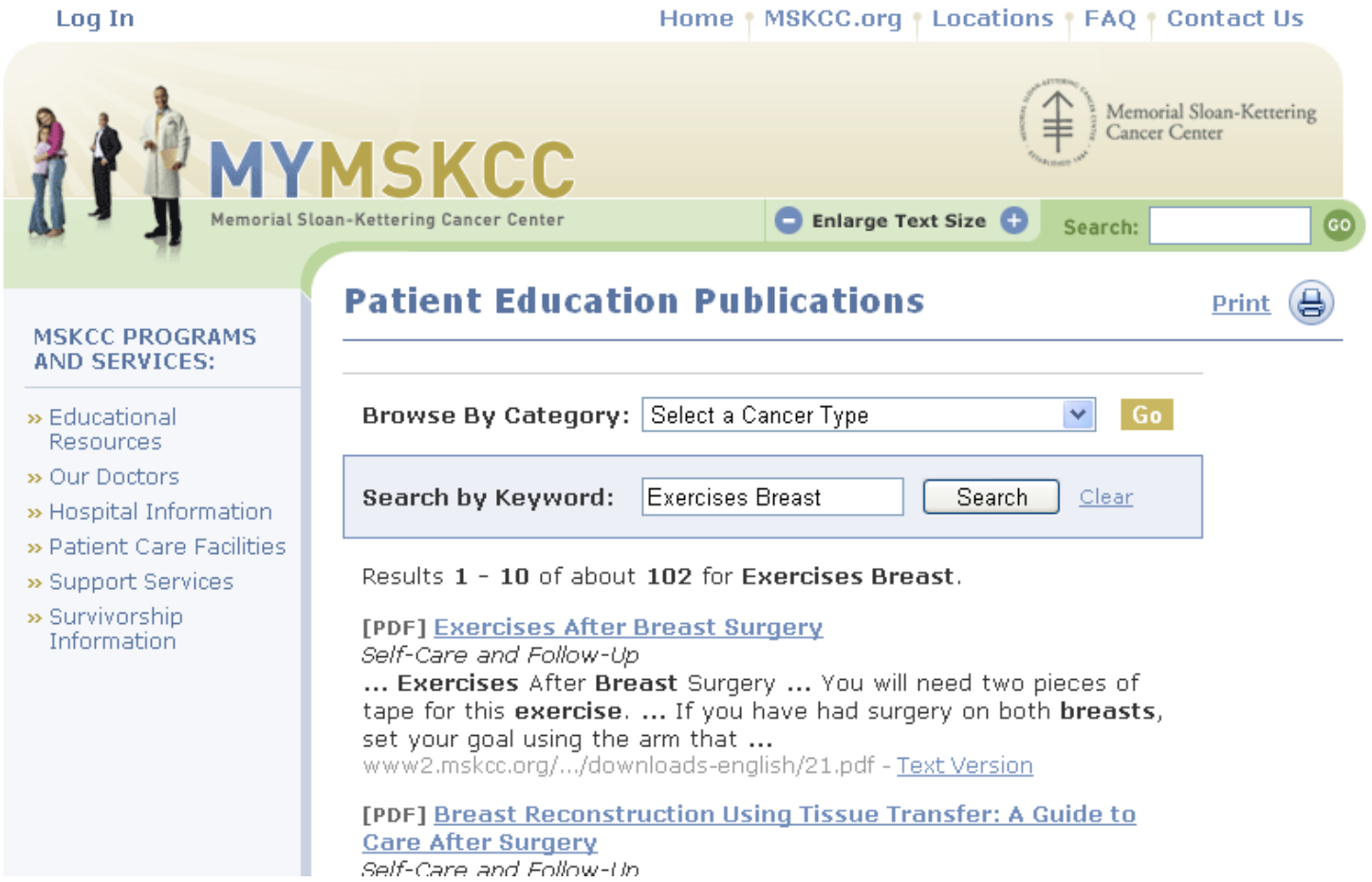
A homegrown content management system (CMS) developed using ASP/Jscript and used to upload and manage a library of PDFs.



# History

## Patient and Caregiver Education

We are online…



# History

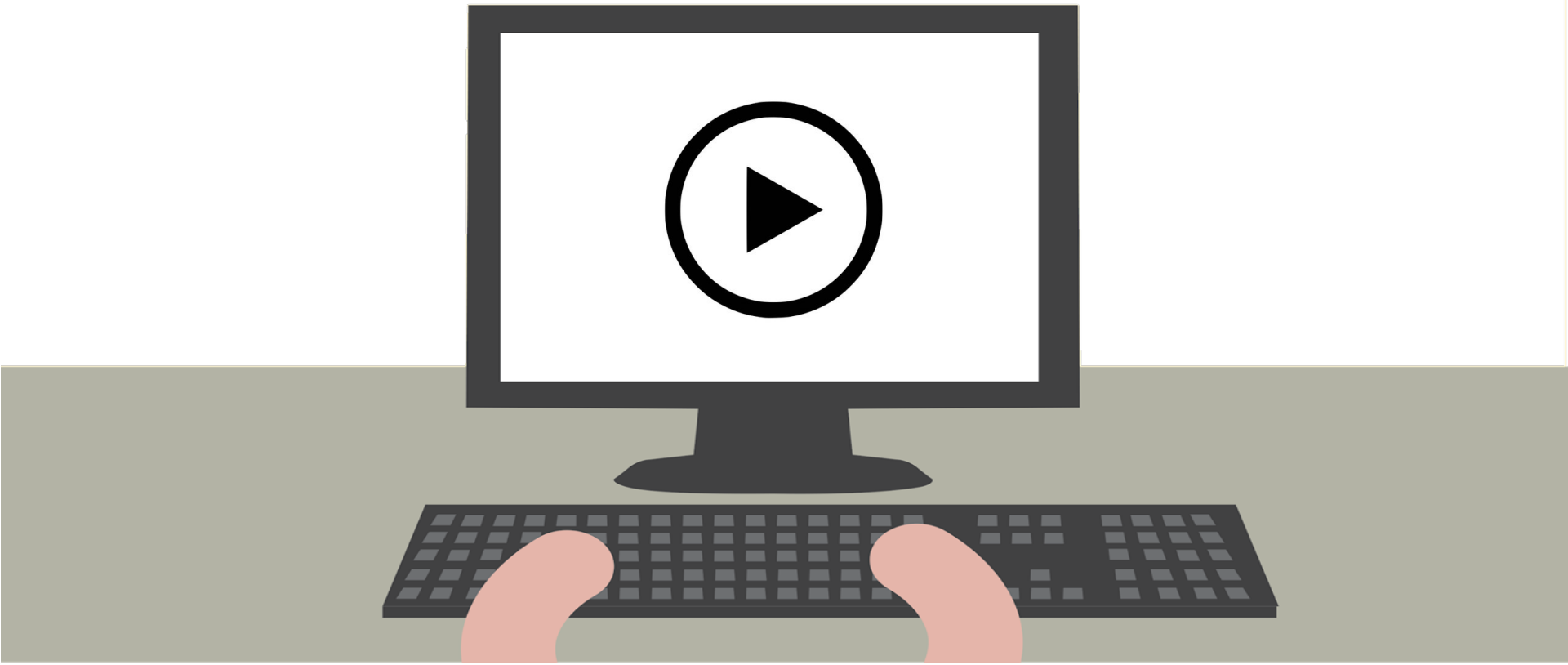
## Patient and Caregiver Education

But only PDFs were available online…

# History

## Patient and Caregiver Education

Video resources



# History

## Patient and Caregiver Education

Translations

# History

## Patient and Caregiver Education

Improve Search

# History

## Patient and Caregiver Education

Send resources to patients and caregivers electronically

# History

# History

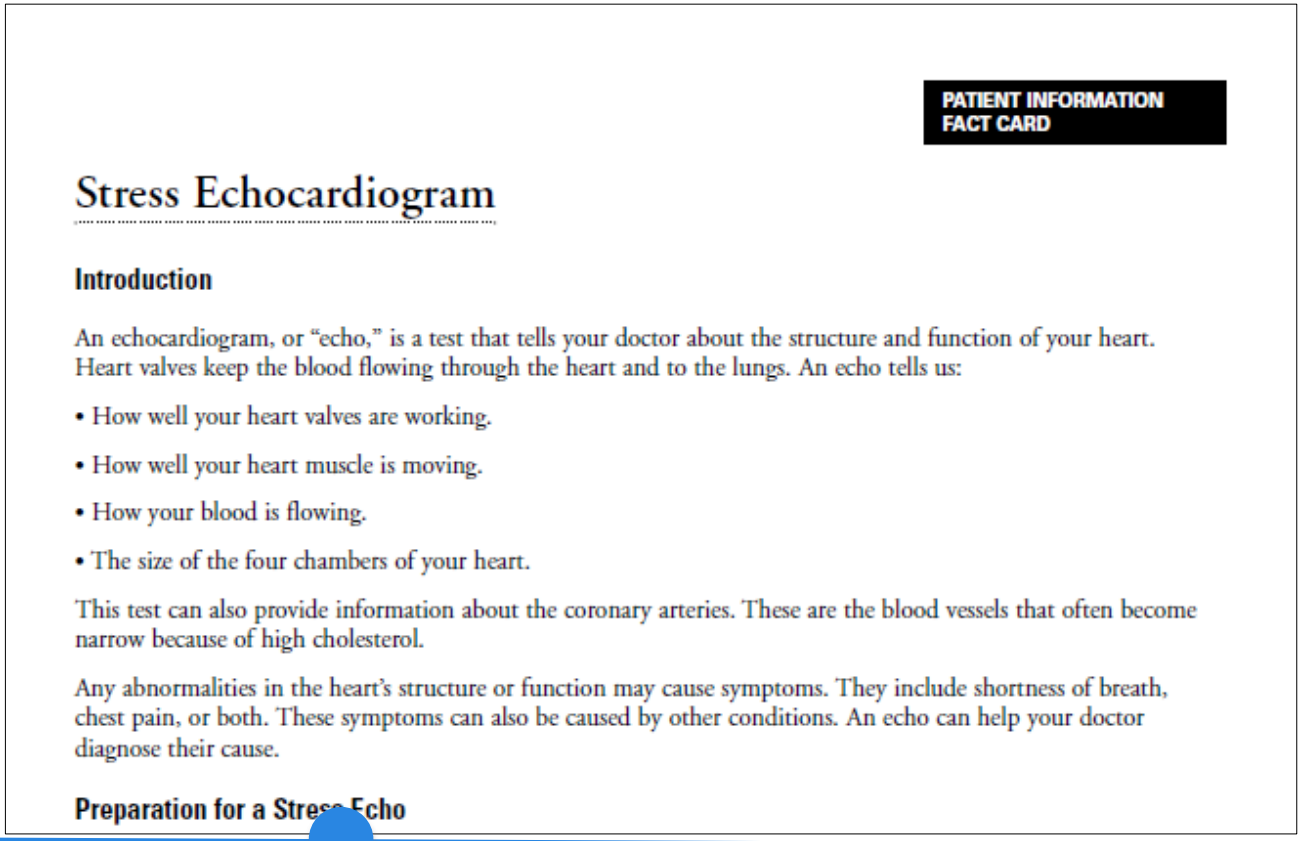
## Drupal 6

- Admin UI
- Taxonomy/Categorization
- Drupal Search
- HTML to PDF
- Translations
- Revisioning
- Rich media support

# History

## Drupal 6

Migration of existing PDFs and PDF translations



PATIENT INFORMATION
FACT CARD

### Stress Echocardiogram

**Introduction**

An echocardiogram, or "echo," is a test that tells your doctor about the structure and function of your heart. Heart valves keep the blood flowing through the heart and to the lungs. An echo tells us:

- How well your heart valves are working.
- How well your heart muscle is moving.
- How your blood is flowing.
- The size of the four chambers of your heart.

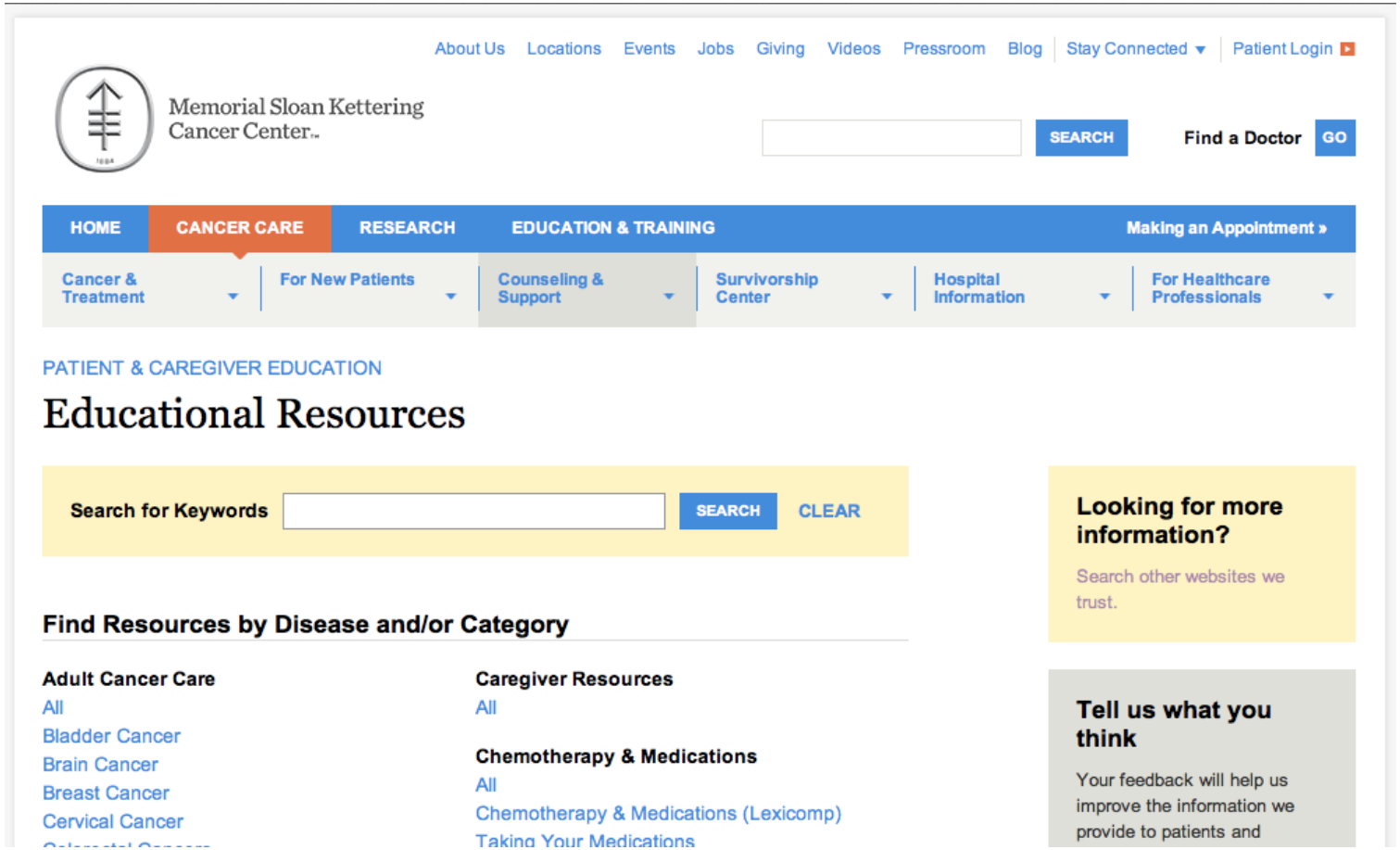
This test can also provide information about the coronary arteries. These are the blood vessels that often become narrow because of high cholesterol.

Any abnormalities in the heart's structure or function may cause symptoms. They include shortness of breath, chest pain, or both. These symptoms can also be caused by other conditions. An echo can help your doctor diagnose their cause.

**Preparation for a Stress Echo**

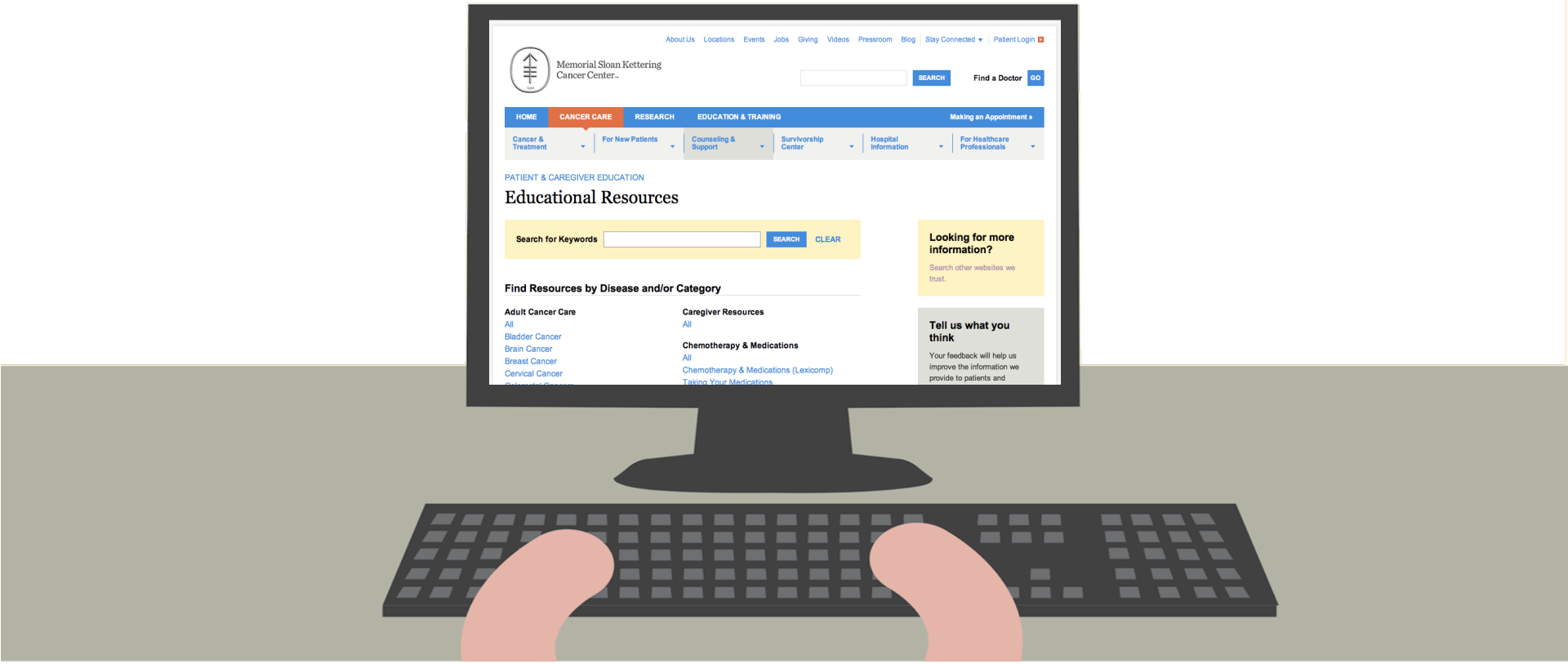
# History

## Drupal 6



# History

## Drupal 6



# History

## Drupal 6

Medication leaflets synced to our site nightly via FTP

# History

## Drupal 6

Green Initiative

Reduce quantity of print resources in circulation

- Resources with low print distribution were made available via web-only
- All new resources to have an HTML version

PATIENT INFORMATION
FACT CARD
Giving an Insulin Injection with the Lantus® SoloStar® Pen
This card describes how to prepare and give an insulin injection with the Lantus SoloStar Pen. Your nurse will review these steps with you and help you practice them.
• Keep all new, unused insulin devices in the refrigerator. Do not freeze them.
• Never put the device you are using back in the refrigerator. Keep it at room temperature, away from heat and sunlight.
• Discard the Lantus SoloStar Pen 28 days after piercing the rubber stopper.
Gather Your Materials
Prepare a clean, steady tabletop on which to work. Gather the following:
• Lantus SoloStar Insulin Pen
• A new single-use insulin needle
• Alcohol swabs
• A wastebasket
• Sharps container (a non-see-through plastic, screw-top container)
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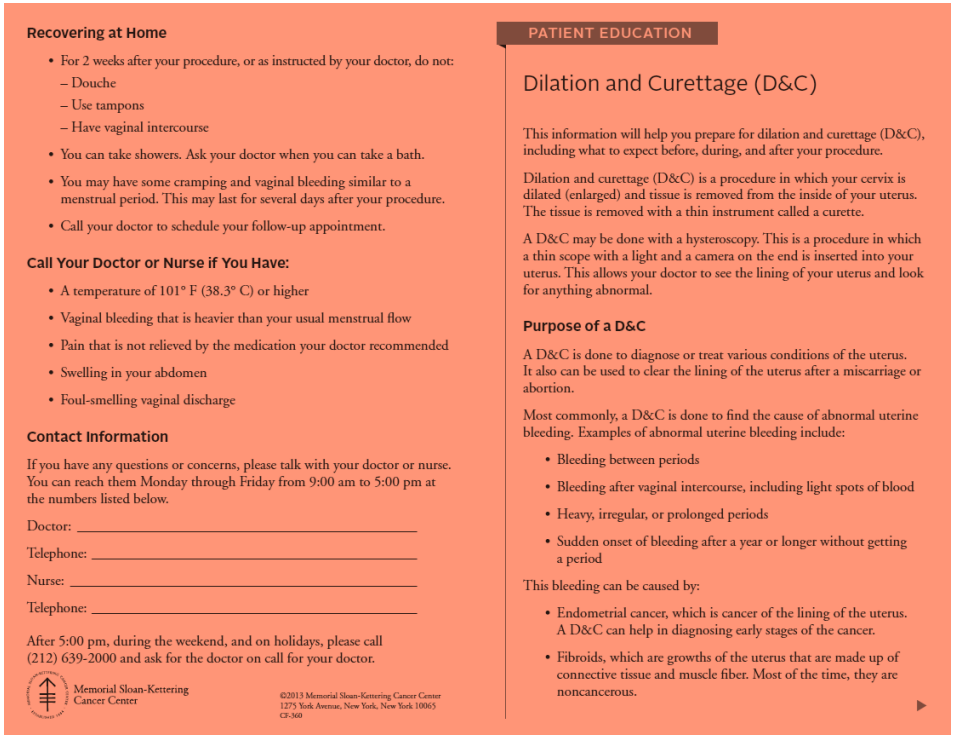
# History

## Drupal 6

Developed print stylesheet for PDFs generated from HTML

- Matched “fact card” layout created by our Graphics team



**Recovering at Home**

- For 2 weeks after your procedure, or as instructed by your doctor, do not:
  - Douche
  - Use tampons
  - Have vaginal intercourse
- You can take showers. Ask your doctor when you can take a bath.
- You may have some cramping and vaginal bleeding similar to a menstrual period. This may last for several days after your procedure.
- Call your doctor to schedule your follow-up appointment.

**Call Your Doctor or Nurse if You Have:**

- A temperature of 101° F (38.3° C) or higher
- Vaginal bleeding that is heavier than your usual menstrual flow
- Pain that is not relieved by the medication your doctor recommended
- Swelling in your abdomen
- Foul-smelling vaginal discharge

**Contact Information**

If you have any questions or concerns, please talk with your doctor or nurse. You can reach them Monday through Friday from 9:00 am to 5:00 pm at the numbers listed below.

Doctor: _____

Telephone: _____

Nurse: _____

Telephone: _____

After 5:00 pm, during the weekend, and on holidays, please call (212) 639-2000 and ask for the doctor on call for your doctor.

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PATIENT EDUCATION

Dilation and Curettage (D&C)

This information will help you prepare for dilation and curettage (D&C), including what to expect before, during, and after your procedure.

Dilation and curettage (D&C) is a procedure in which your cervix is dilated (enlarged) and tissue is removed from the inside of your uterus. The tissue is removed with a thin instrument called a curette.

A D&C may be done with a hysteroscopy. This is a procedure in which a thin scope with a light and a camera on the end is inserted into your uterus. This allows your doctor to see the lining of your uterus and look for anything abnormal.

**Purpose of a D&C**

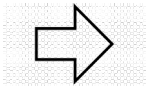
A D&C is done to diagnose or treat various conditions of the uterus. It also can be used to clear the lining of the uterus after a miscarriage or abortion.

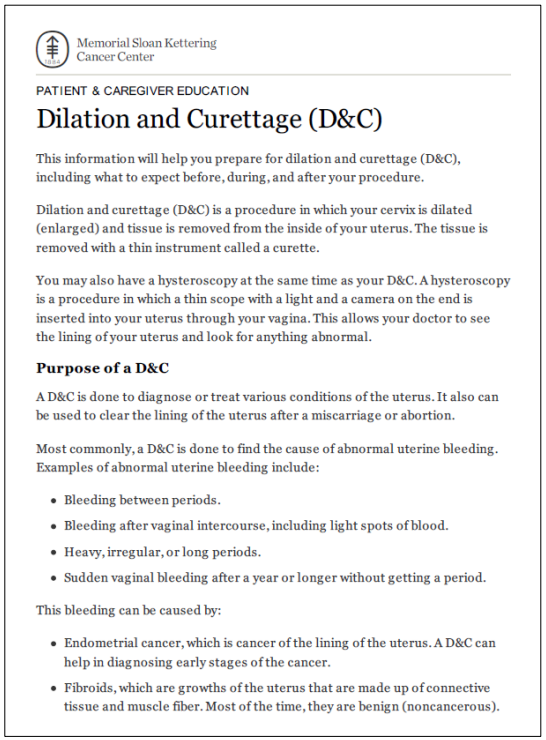
Most commonly, a D&C is done to find the cause of abnormal uterine bleeding. Examples of abnormal uterine bleeding include:

- Bleeding between periods
- Bleeding after vaginal intercourse, including light spots of blood
- Heavy, irregular, or prolonged periods
- Sudden onset of bleeding after a year or longer without getting a period

This bleeding can be caused by:

- Endometrial cancer, which is cancer of the lining of the uterus. A D&C can help in diagnosing early stages of the cancer.
- Fibroids, which are growths of the uterus that are made up of connective tissue and muscle fiber. Most of the time, they are noncancerous.





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PATIENT & CAREGIVER EDUCATION

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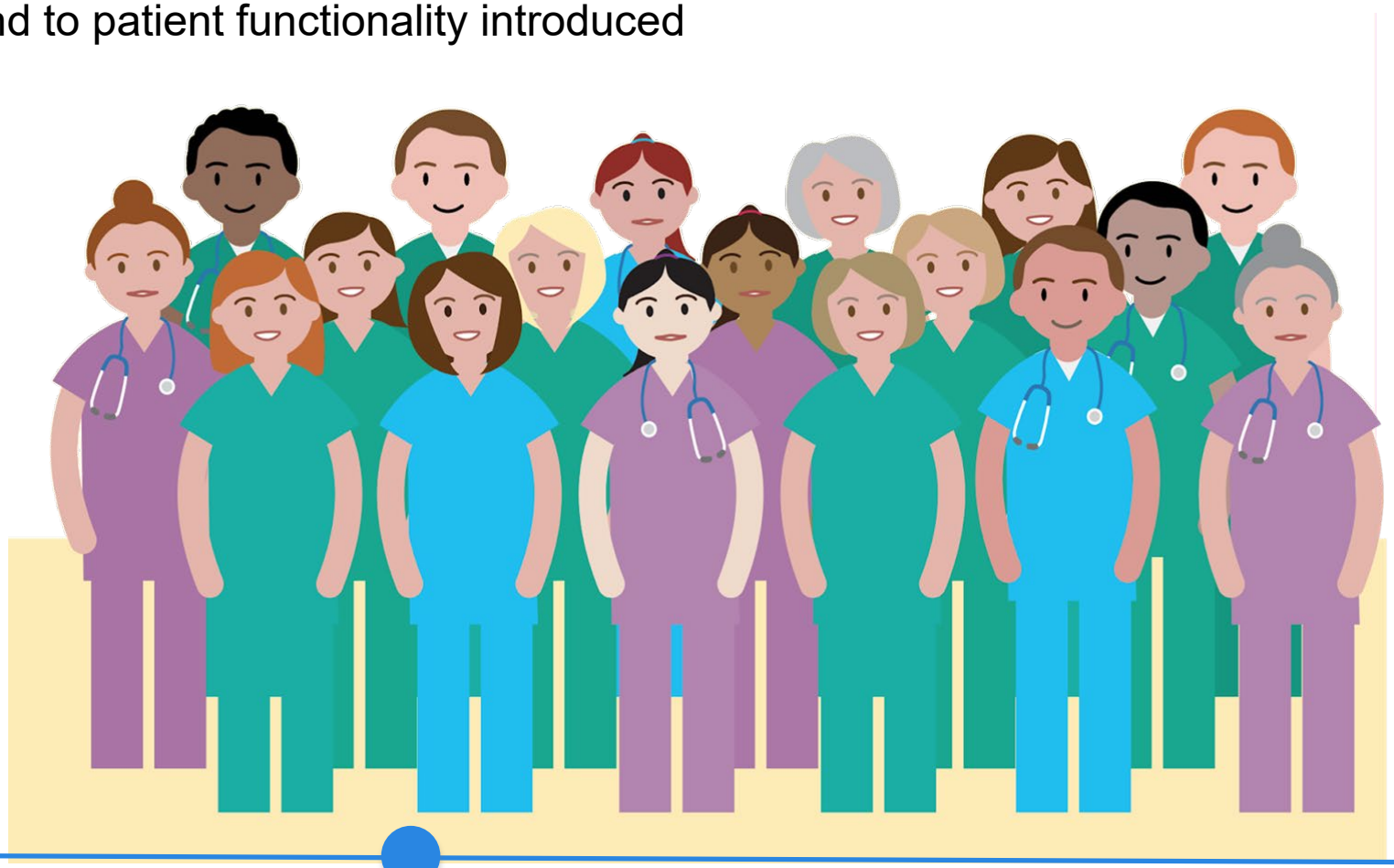
# History

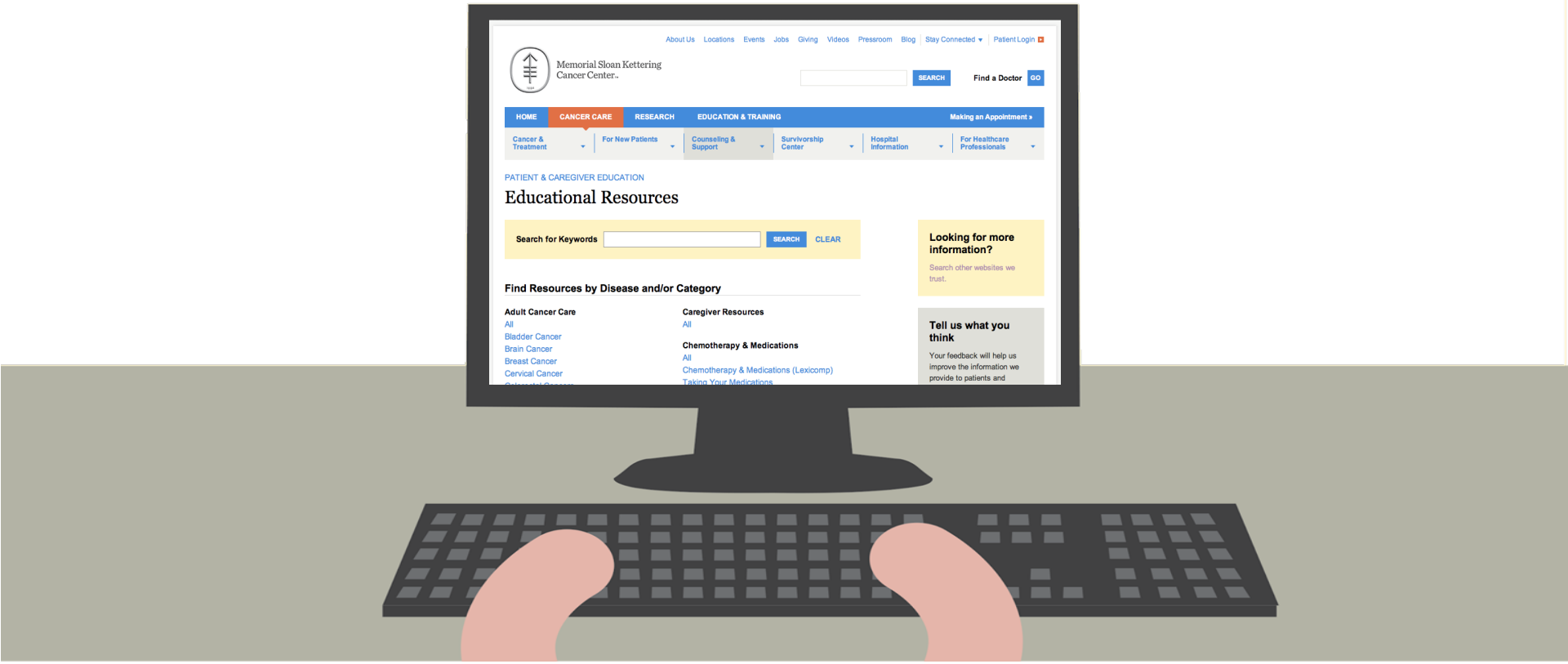
## Drupal 6

Send to patient functionality introduced



# History

## Drupal 6



# History

Drupal™

# History

## Drupal 8

As we were migrating from a Drupal 6 site, our Communications team opted to move to Drupal 8 in alpha versus upgrading to Drupal 7 for the long-term benefits of being on the latest platform.

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# Migration

# Migration

## Drupal 8

Converting all static PDFs to HTML

Involved converting .indd files to HTML and importing to CMS as nodes in Drupal for cleanup by content editors

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# Aggregation

# Aggregation

## Drupal 8

Expanded content types

- Text
- External Text
- Videos
- External Videos
- About Herbs
- Adult Medications (Lexicomp)
- Pediatric Medications (Lexicomp)
- Presentations
- Webcasts
- Online Support Groups

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# Implementation

# Implementation

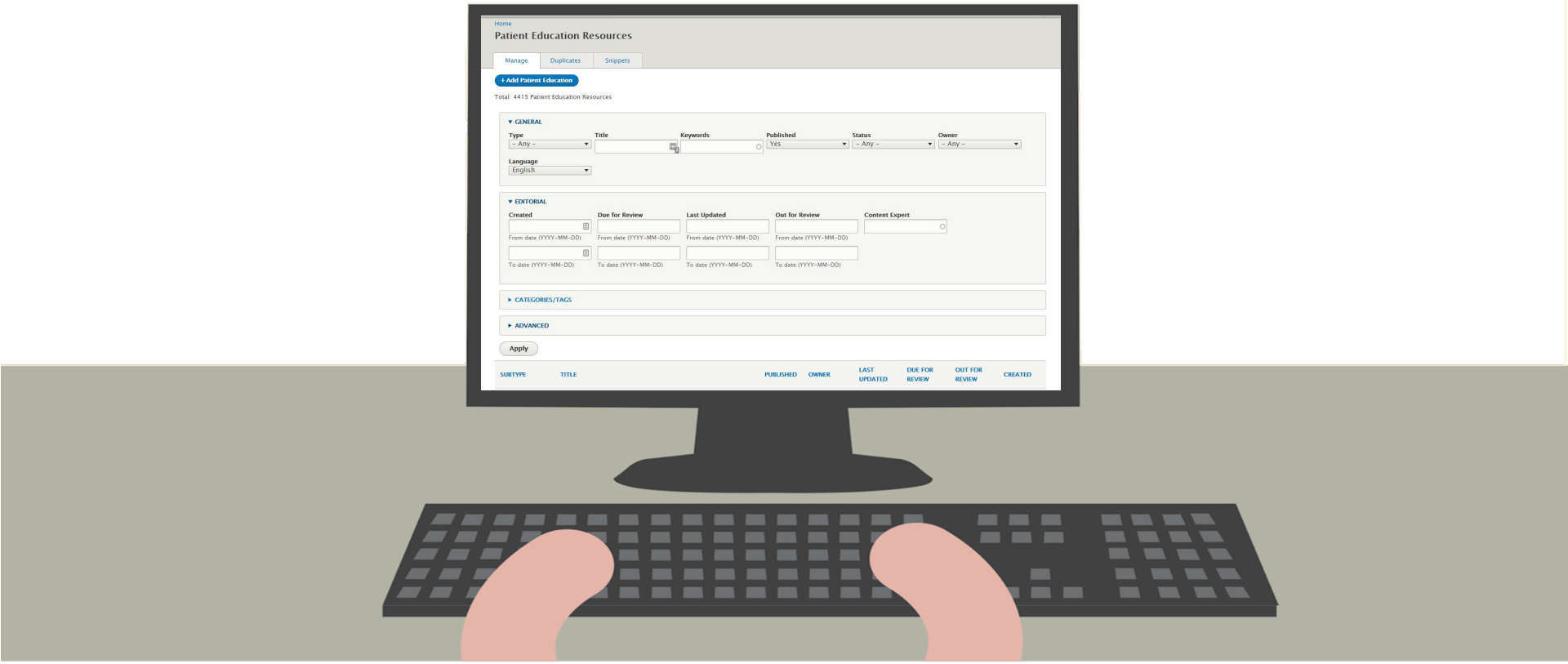
## Drupal 8

- Admin UI
- Revisioning
- Translations
- Search
- Improved PDF generation

# Implementation

## Drupal 8

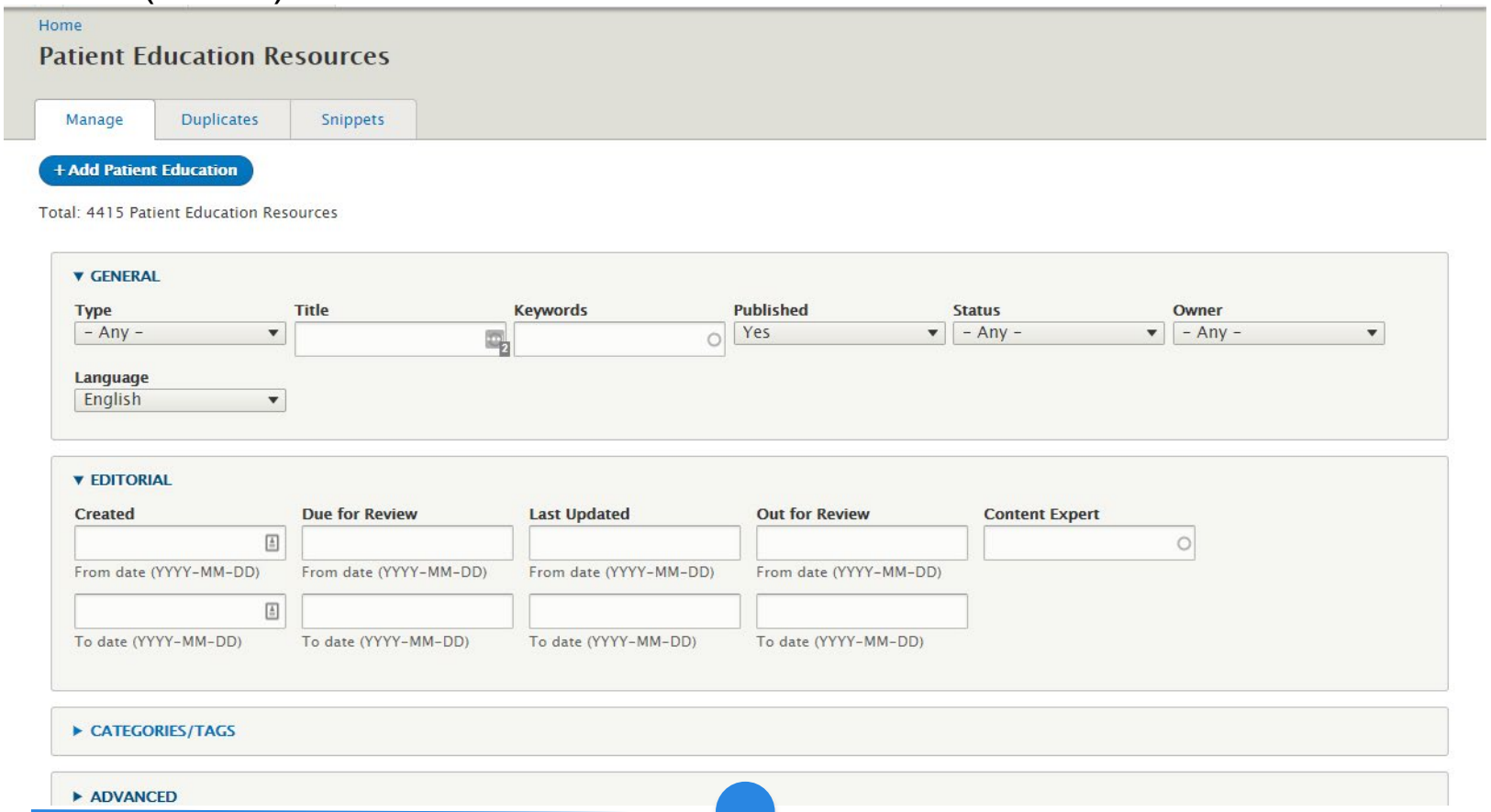
Admin UI (Views)



# Implementation

## Drupal 8

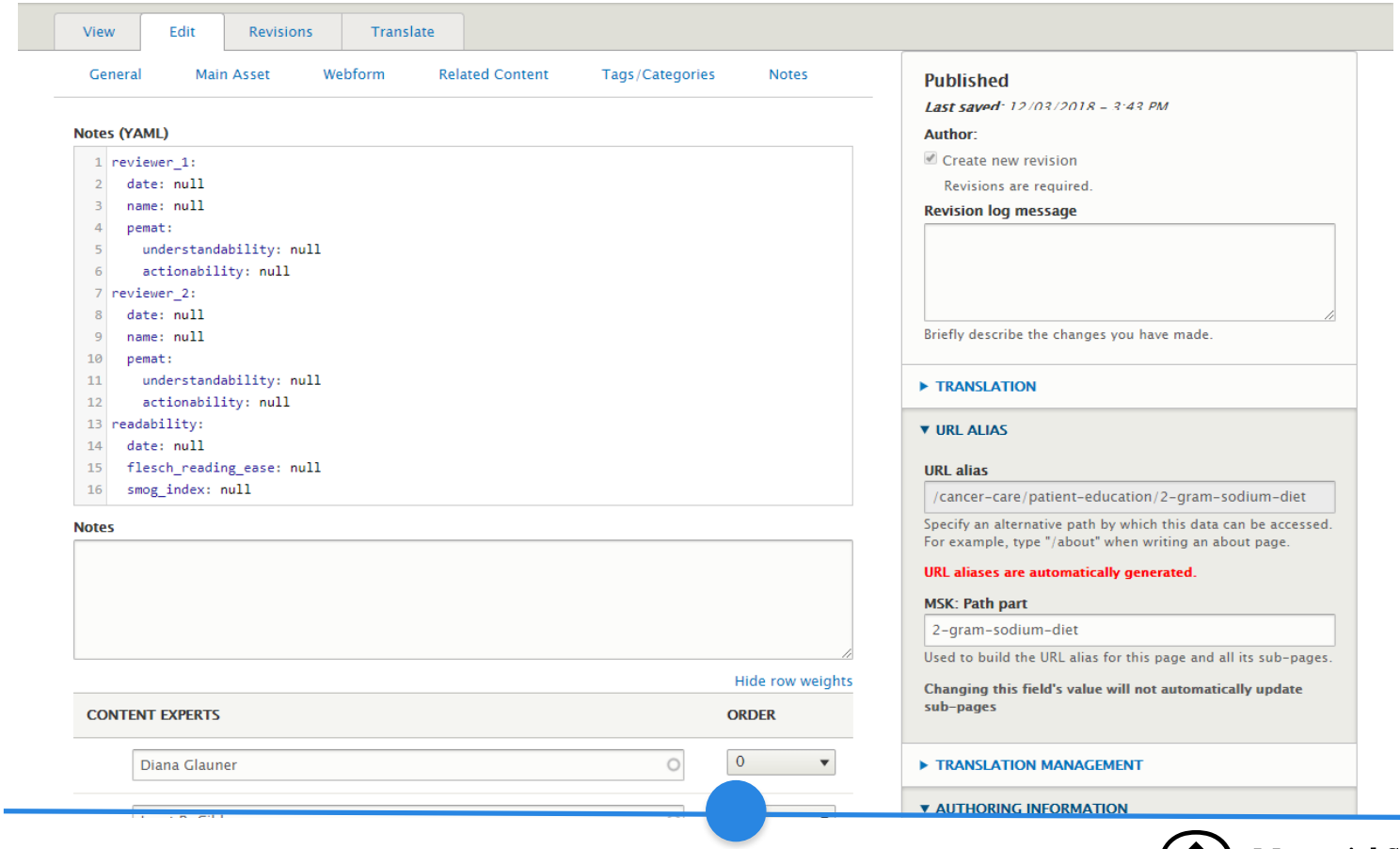
Admin UI (Views)



# Implementation

## Drupal 8

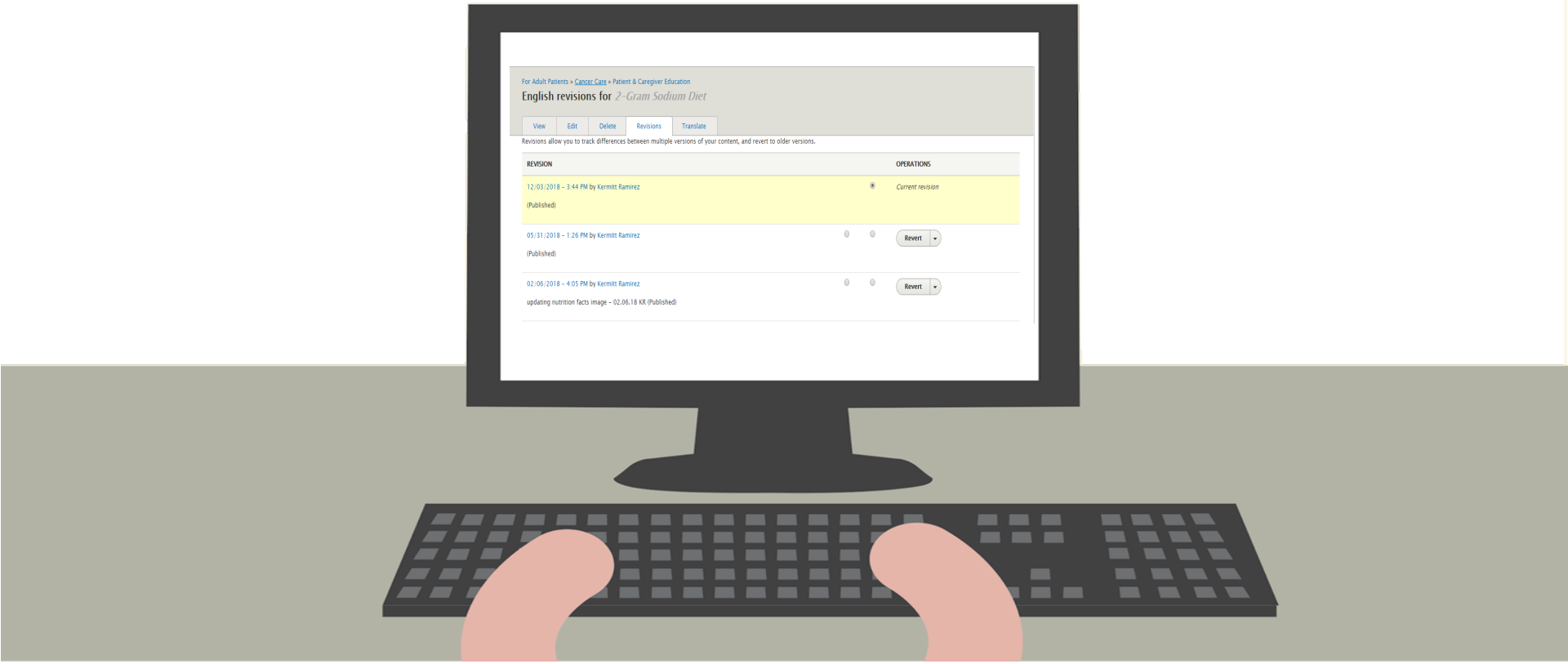
Admin UI (Node Edit Form)



# Implementation

## Drupal 8

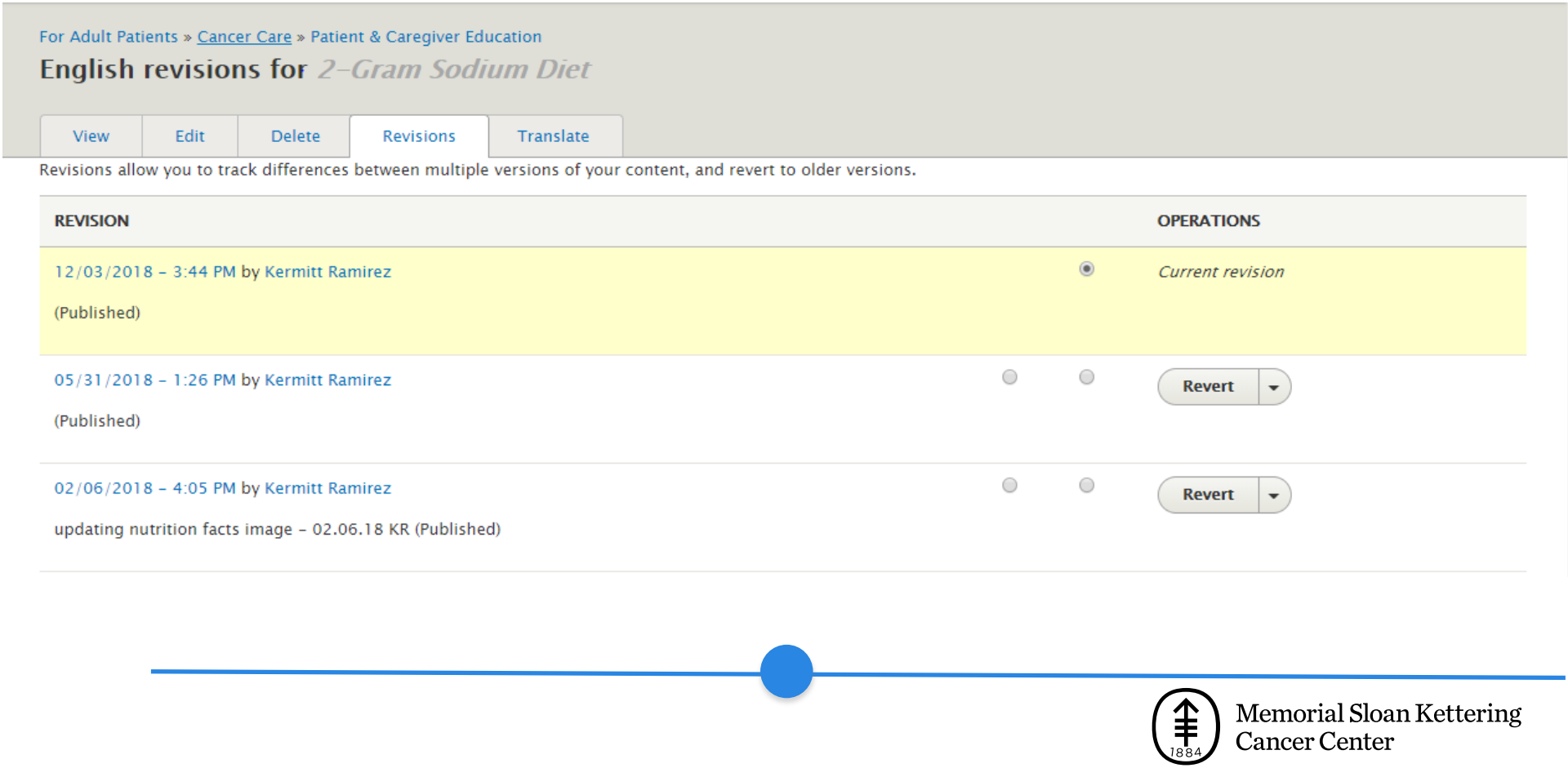
Revisioning (Content Moderation)



# Implementation

## Drupal 8

Revisioning



# Implementation

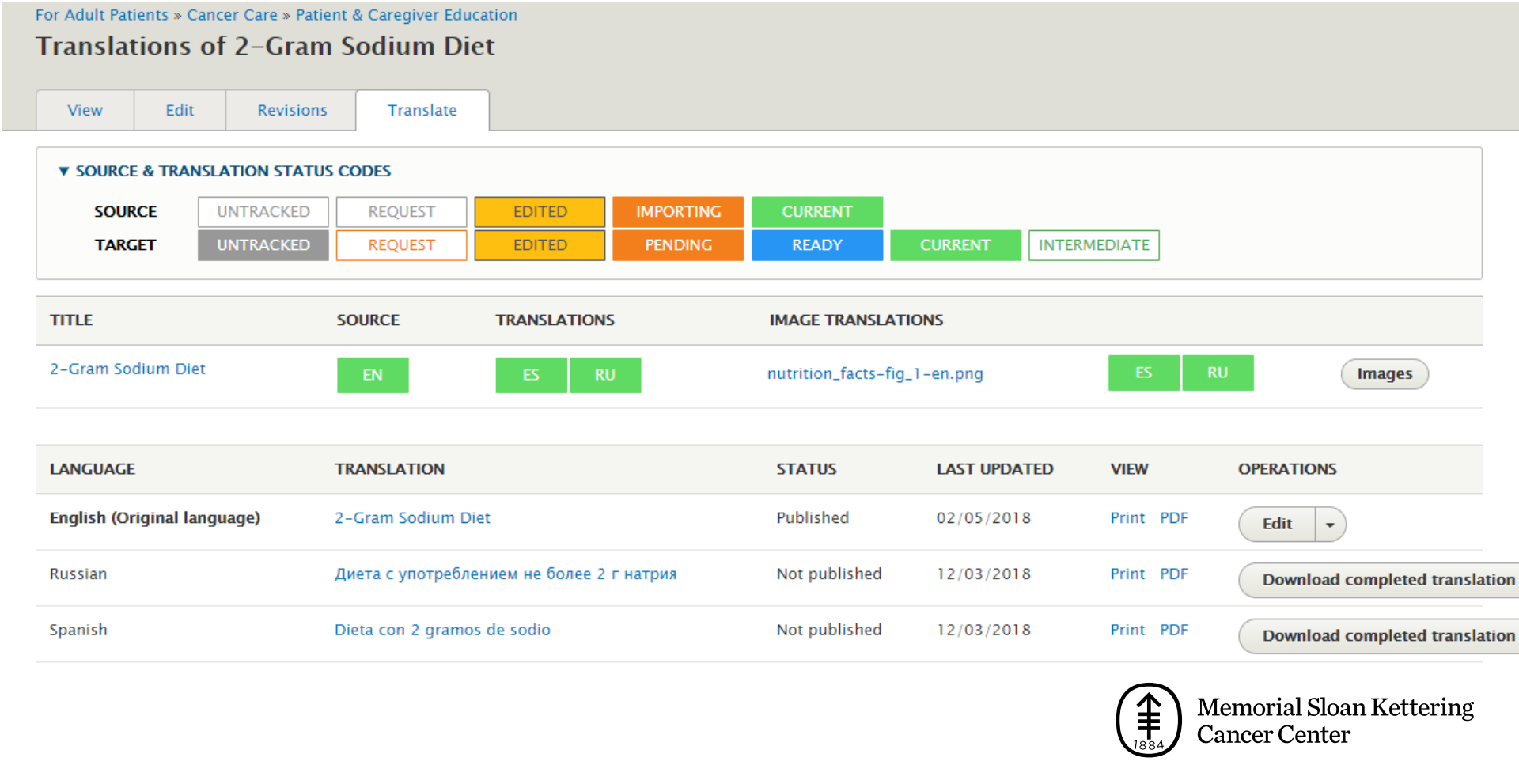
## Drupal 8

Translations

# Implementation

## Drupal 8

Lingotek Professional Translations

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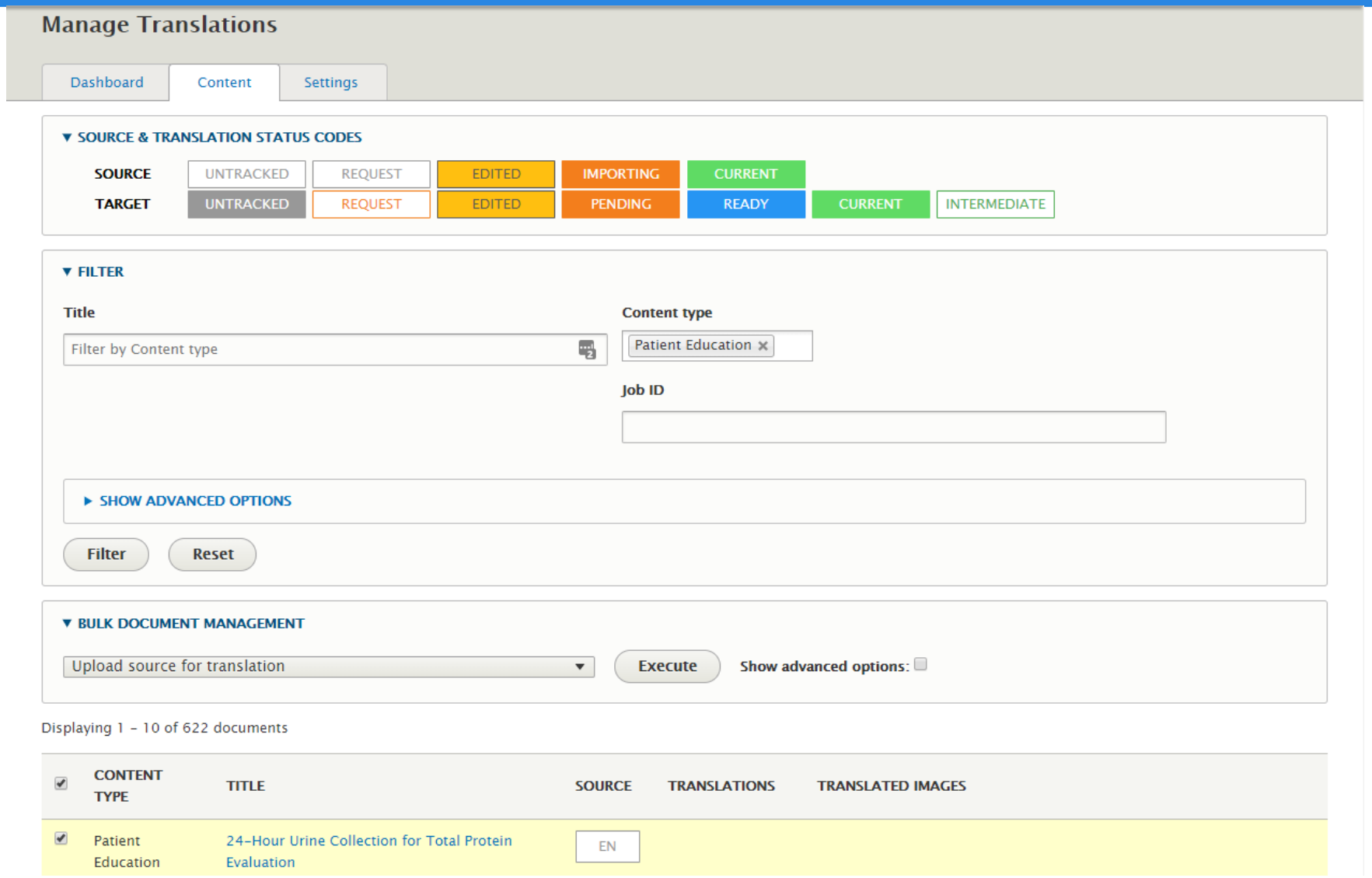
# Implementation

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# Implementation

## Drupal 8

Instant Search

# Implementation

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Sloan Kettering Institute | Giving | Locations | Doctors | Appointments | Contact

Search

For Adult Patients | For Child & Teen Patients | For Healthcare Professionals | For Research Scientists | More | Languages | MyMSK

For Adult Patients / Cancer Care

## Patient & Caregiver Education

We invite you to search our virtual library, where you can find written resources, videos, and online programs.

Search by keyword

Our Patient & Caregiver Education Program is dedicated to educating and empowering people with cancer, their caregivers, and the public. We know that navigating cancer care information can be overwhelming. That's why our Health Education Specialists work with MSK healthcare providers to develop accurate, clear, and reliable educational resources. Learn more about our staff »

We also offer live, online education and support groups through our Virtual Programs. From the comfort of your own home, you can participate in professionally led, confidential, and free interactive programs that allow you to connect with other people with cancer and their caregivers.

InSight Care Educational Templates

### Educational Resources

Send or Print | Manage My Lists

My Lists

Add resources to your list by clicking the checkbox next to the title.

Learn how to create and manage your resource lists

Log out

### Looking For More Information?

Search other websites we trust.

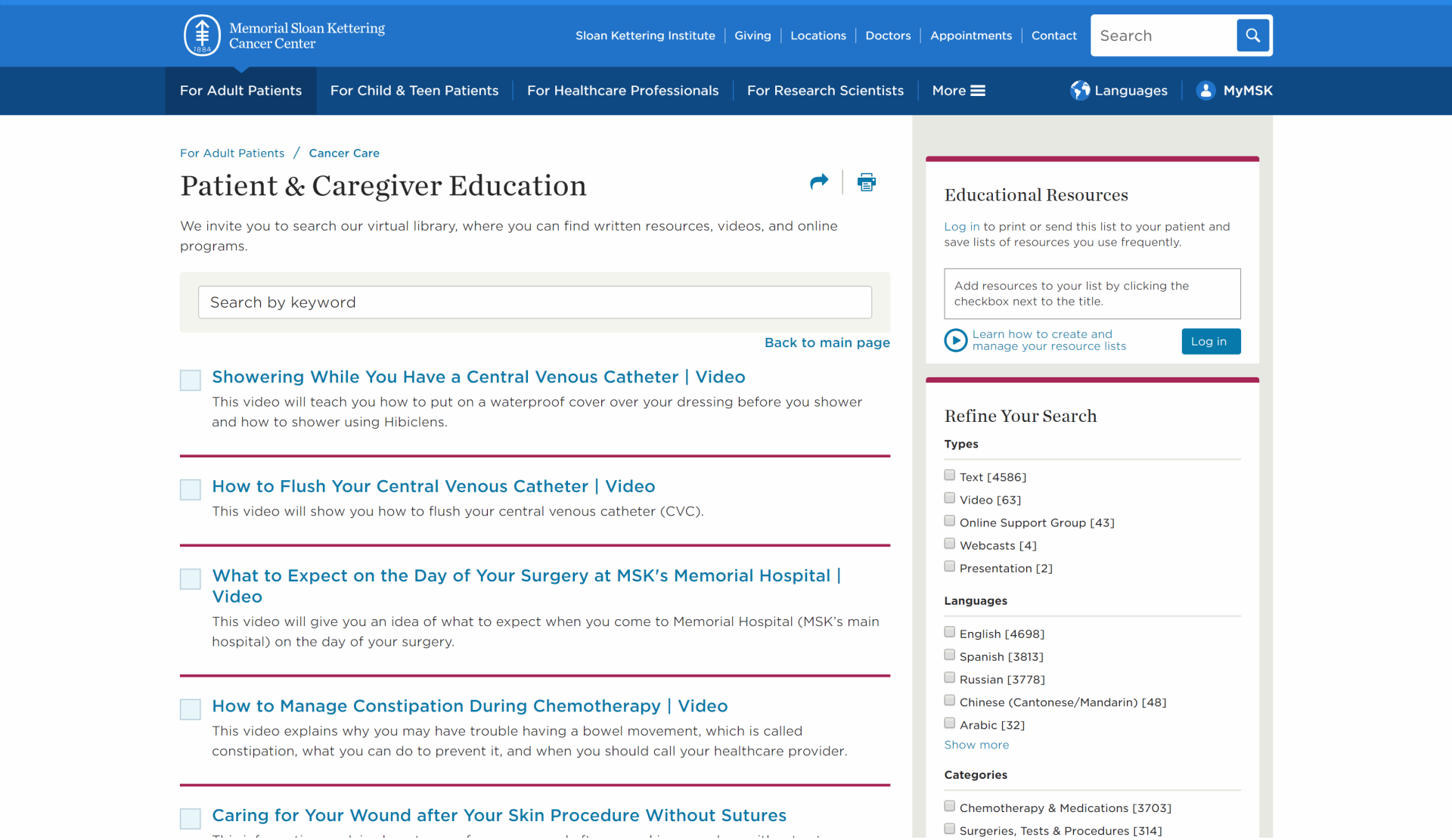
Google™ Custom Search

### Contact Us

- Request a new resource

Memorial Sloan Kettering Cancer Center

# Implementation

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# Implementation

## Drupal 8

Drupal and Algolia Search Integration

**InstantSearch APIs (Front-End/JavaScript)**

InstantSearch.js makes it easy to design the perfect search experience using prepackaged search widgets or by creating your own!

https://community.algolia.com/instantsearch.js

**Search API Algolia (Back-End/Drupal)**

Provides Drupal Search API integration with the Algolia search engine

https://www.drupal.org/project/search_api_algolia

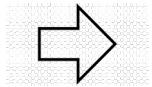
# Implementation

## Drupal 8

PDF Generation Tips

**HTML to PDF conversion**

- Keep it simple
  - Basic markup
  - No custom fonts
- Presentation
  - Page breaks
  - PDF previews
- Performance
  - Caching
  - No JavaScript



# Implementation

## Drupal 8

PDF Generation Tools

**wkhtmltopdf**

CLI tool for rendering HTML into PDF using the WebKit rendering engine.

https://wkhtmltopdf.org/

**XPDF**

PDF viewer/toolkit, including a text extractor, and image and HTML converter.

https://www.xpdfreader.com/

**GhostScript**

An interpreter for the PostScript language and for PDF.

https://www.ghostscript.com

# Implementation

## Drupal 8

Drupal PDF Generation Modules

**Printer, email and PDF versions for Drupal 8**

Generates a printer-friendly version of Drupal content entities.

https://www.drupal.org/project/printable

**Entity Print**

Allows any Drupal entity to be converted to a PDF

https://www.drupal.org/project/entity_print

# Implementation

## Drupal 8

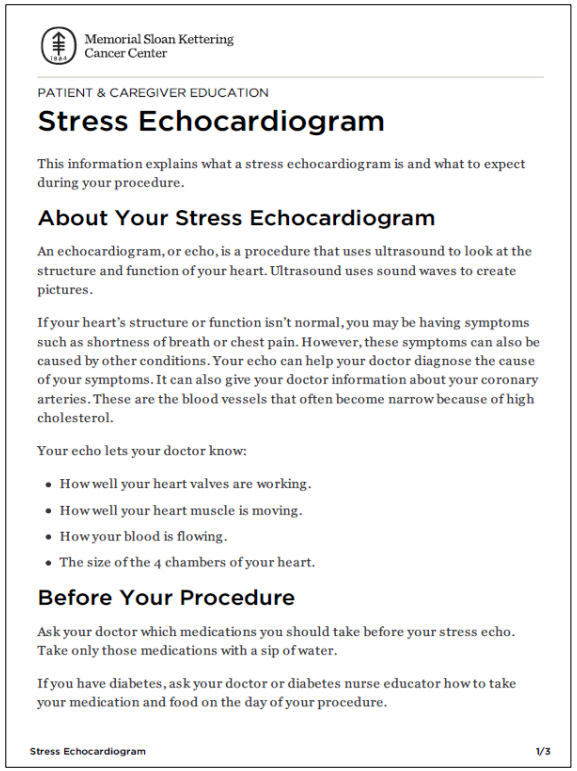
Thanks to the improvements to PDF generation, we were able to discontinue printing on card stock

# Implementation

## Drupal 8

Accessibility Improvements

### Standard Font PDFs



Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

**Stress Echocardiogram**

This information explains what a stress echocardiogram is and what to expect during your procedure.

**About Your Stress Echocardiogram**

An echocardiogram, or echo, is a procedure that uses ultrasound to look at the structure and function of your heart. Ultrasound uses sound waves to create pictures.

If your heart's structure or function isn't normal, you may be having symptoms such as shortness of breath or chest pain. However, these symptoms can also be caused by other conditions. Your echo can help your doctor diagnose the cause of your symptoms. It can also give your doctor information about your coronary arteries. These are the blood vessels that often become narrow because of high cholesterol.

Your echo lets your doctor know:

- How well your heart valves are working.
- How well your heart muscle is moving.
- How your blood is flowing.
- The size of the 4 chambers of your heart.

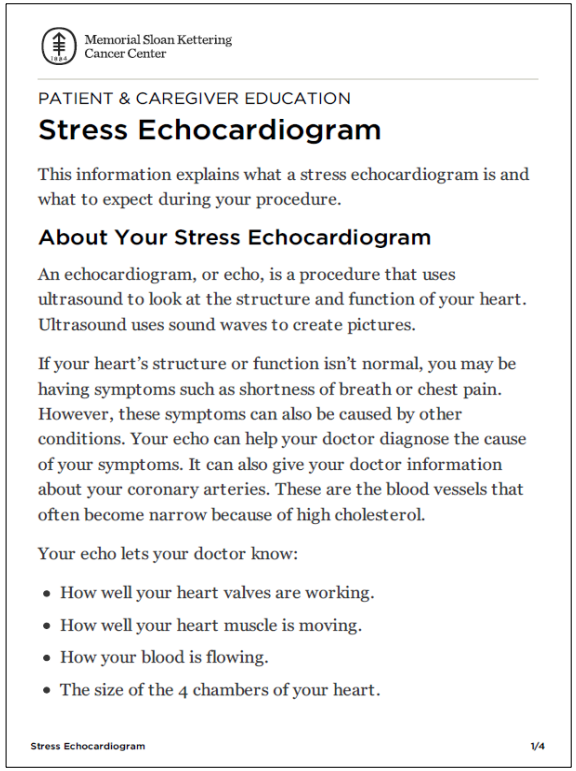
**Before Your Procedure**

Ask your doctor which medications you should take before your stress echo. Take only those medications with a sip of water.

If you have diabetes, ask your doctor or diabetes nurse educator how to take your medication and food on the day of your procedure.

Stress Echocardiogram 1/3

### Large Font PDFs



Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

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- How your blood is flowing.
- The size of the 4 chambers of your heart.

Stress Echocardiogram 1/4

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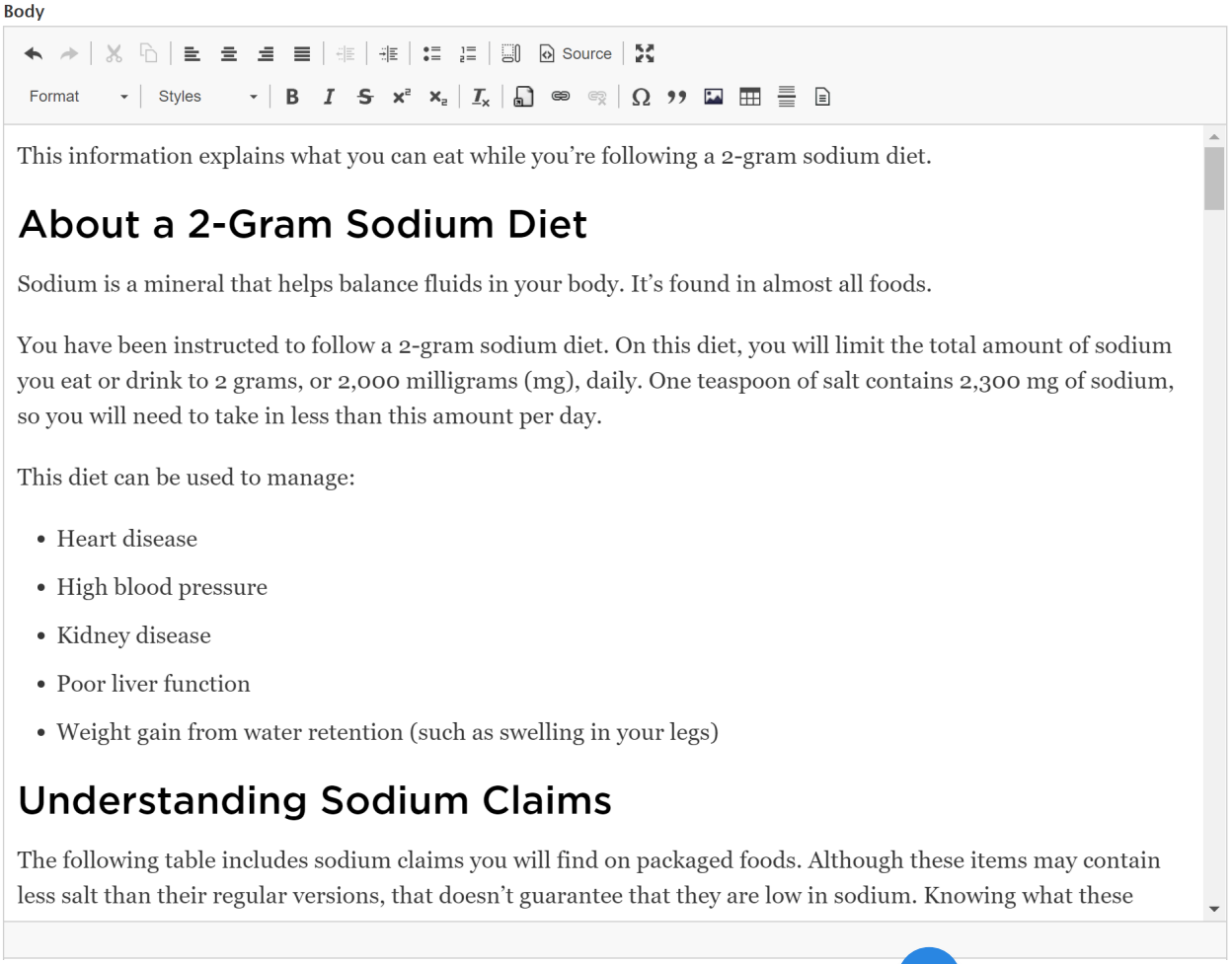
# Editor

# Editor

## Drupal 8

Print/PDF Stylesheet in CKEditor



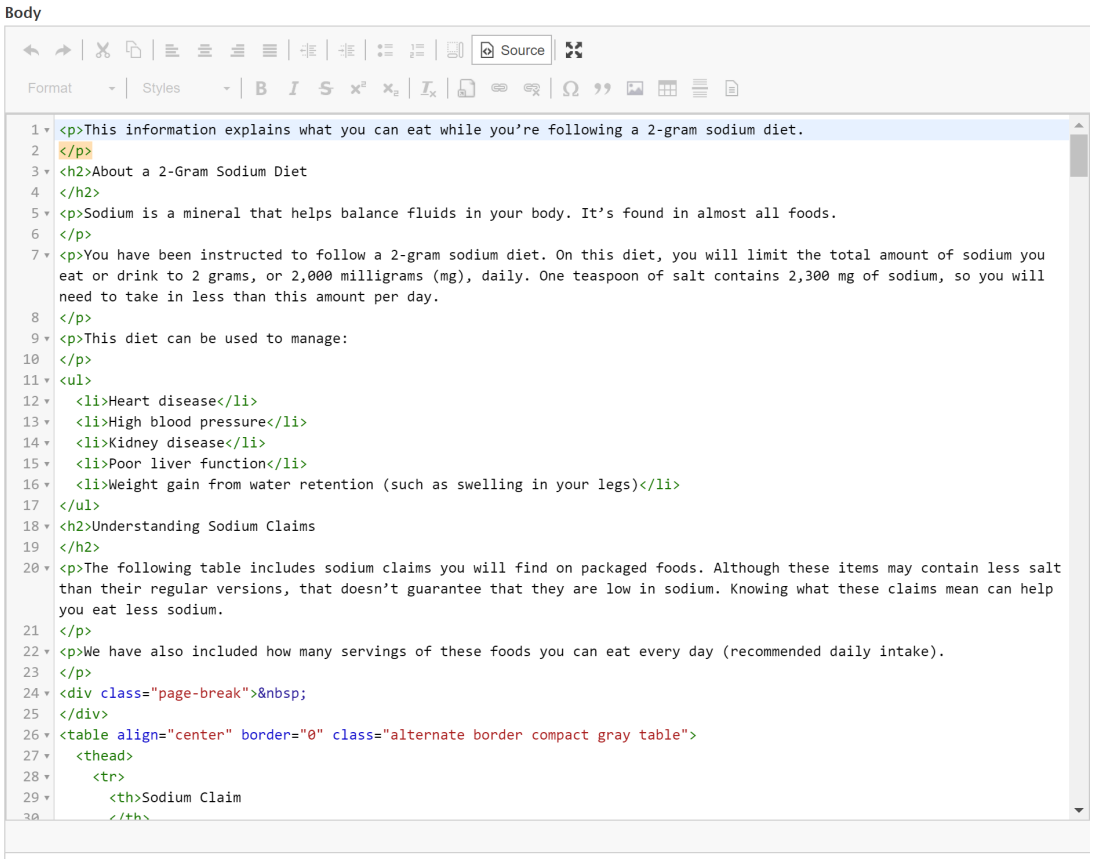
# Editor

## Drupal 8

Code Mirror Module

Adds syntax highlighting for "Source View" in CKEditor WYSIWYG editor using

https://www.drupal.org/project/ckeditor_codemirror



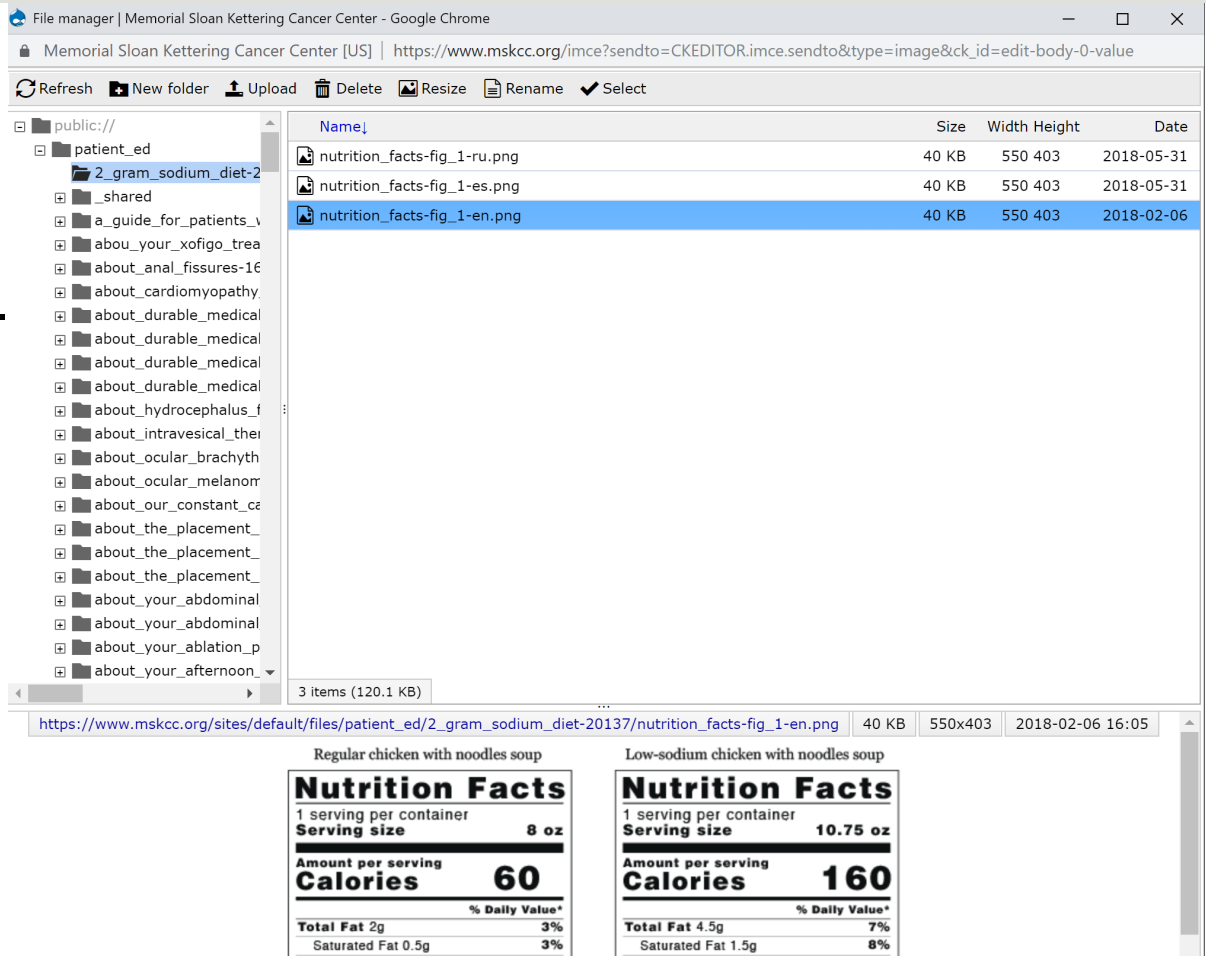
# Editor

## Drupal 8

IMCE

IMCE is an image/file directories and quota.

https://www.drupal.org/project/imce

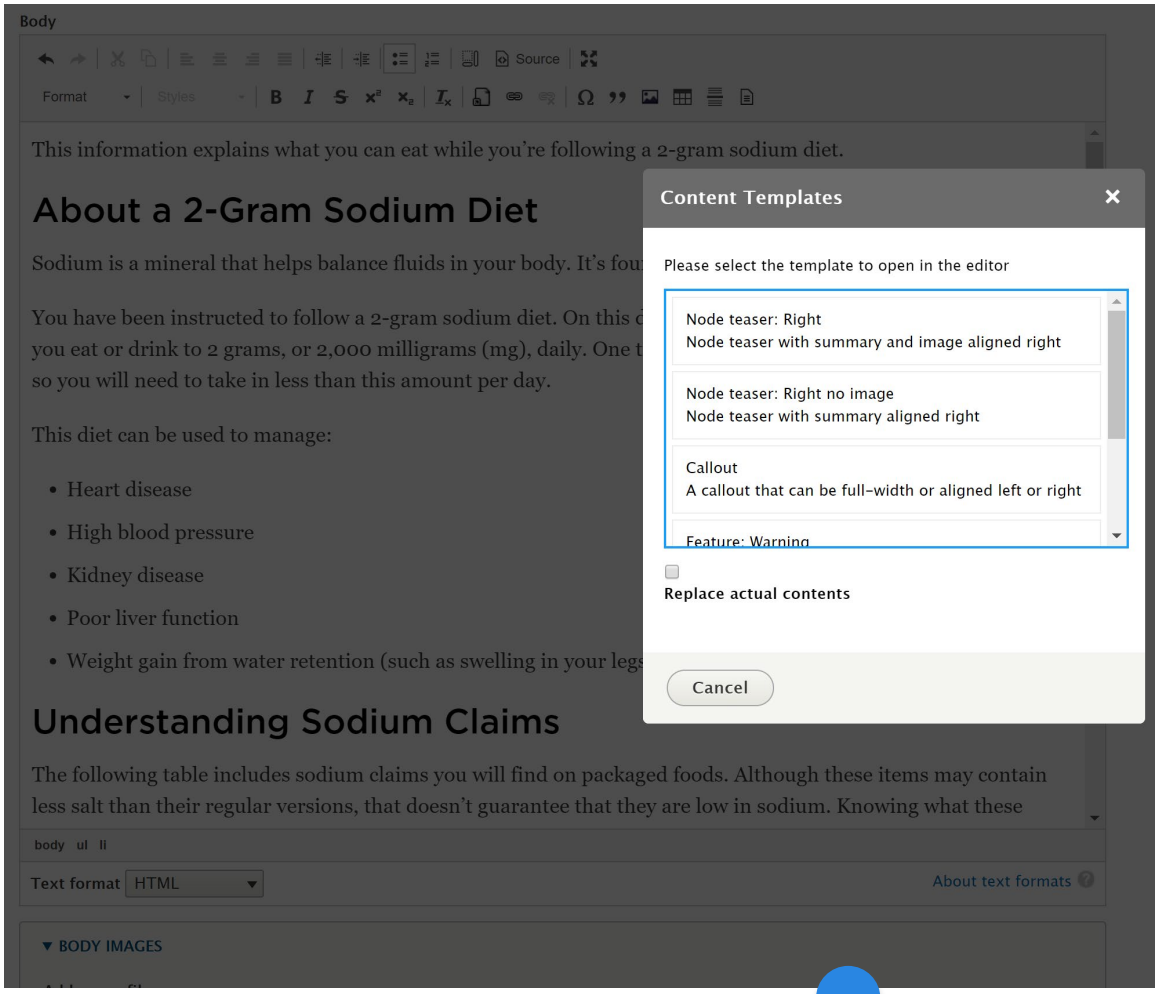


# Editor

## Drupal 8

CK Editor Templates

https://www.drupal.org/project/wysiwyg_template



# Editor

## Drupal 8

Entity Embed

Allows any entity to be embedded within a text area using a WYSIWYG editor.

https://www.drupal.org/project/entity_embed

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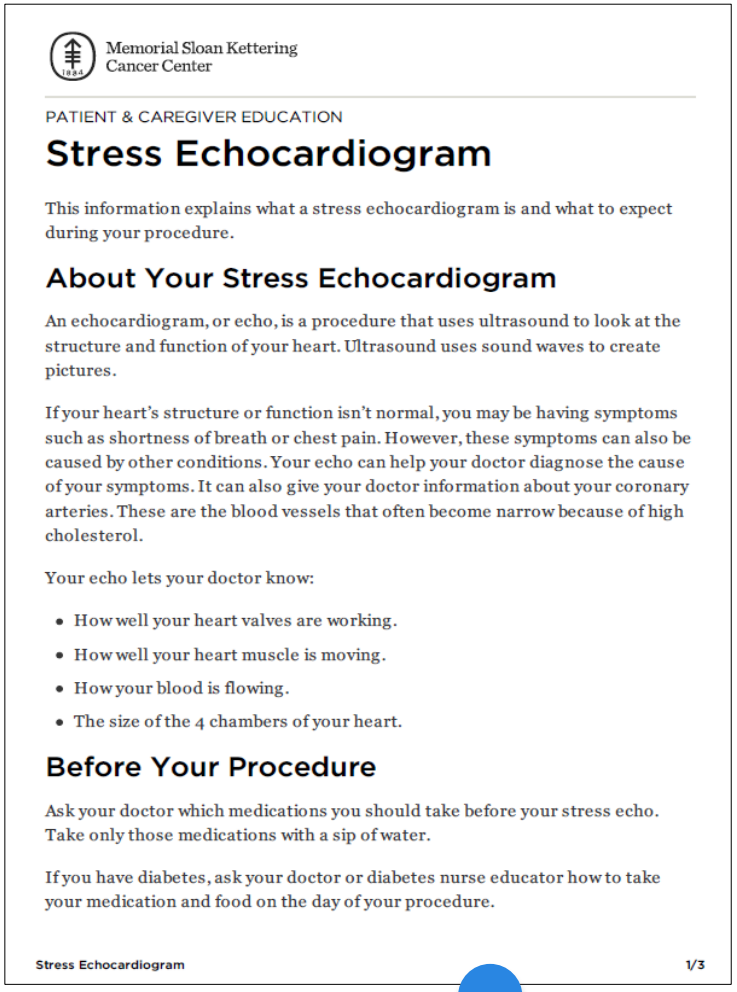
# Distribution

# Distribution

## Drupal 8

As some clinics may not be equipped to print resources on demand for patients and their caregivers, clinicians can still request certain high demand resources as 8 ½ x 11 printouts.



Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

### Stress Echocardiogram

This information explains what a stress echocardiogram is and what to expect during your procedure.

#### About Your Stress Echocardiogram

An echocardiogram, or echo, is a procedure that uses ultrasound to look at the structure and function of your heart. Ultrasound uses sound waves to create pictures.

If your heart's structure or function isn't normal, you may be having symptoms such as shortness of breath or chest pain. However, these symptoms can also be caused by other conditions. Your echo can help your doctor diagnose the cause of your symptoms. It can also give your doctor information about your coronary arteries. These are the blood vessels that often become narrow because of high cholesterol.

Your echo lets your doctor know:

- How well your heart valves are working.
- How well your heart muscle is moving.
- How your blood is flowing.
- The size of the 4 chambers of your heart.

#### Before Your Procedure

Ask your doctor which medications you should take before your stress echo. Take only those medications with a sip of water.

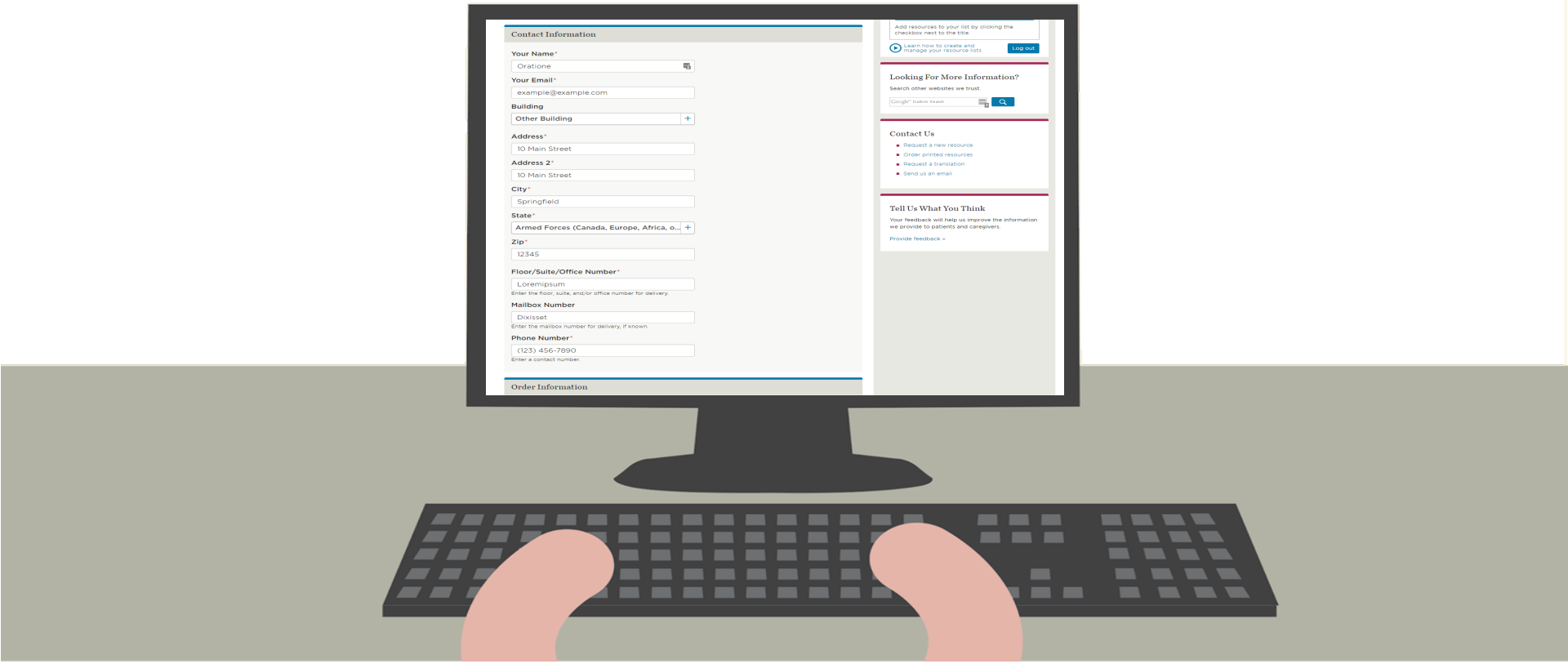
If you have diabetes, ask your doctor or diabetes nurse educator how to take your medication and food on the day of your procedure.

Stress Echocardiogram 1/3

# Distribution

## Drupal 8

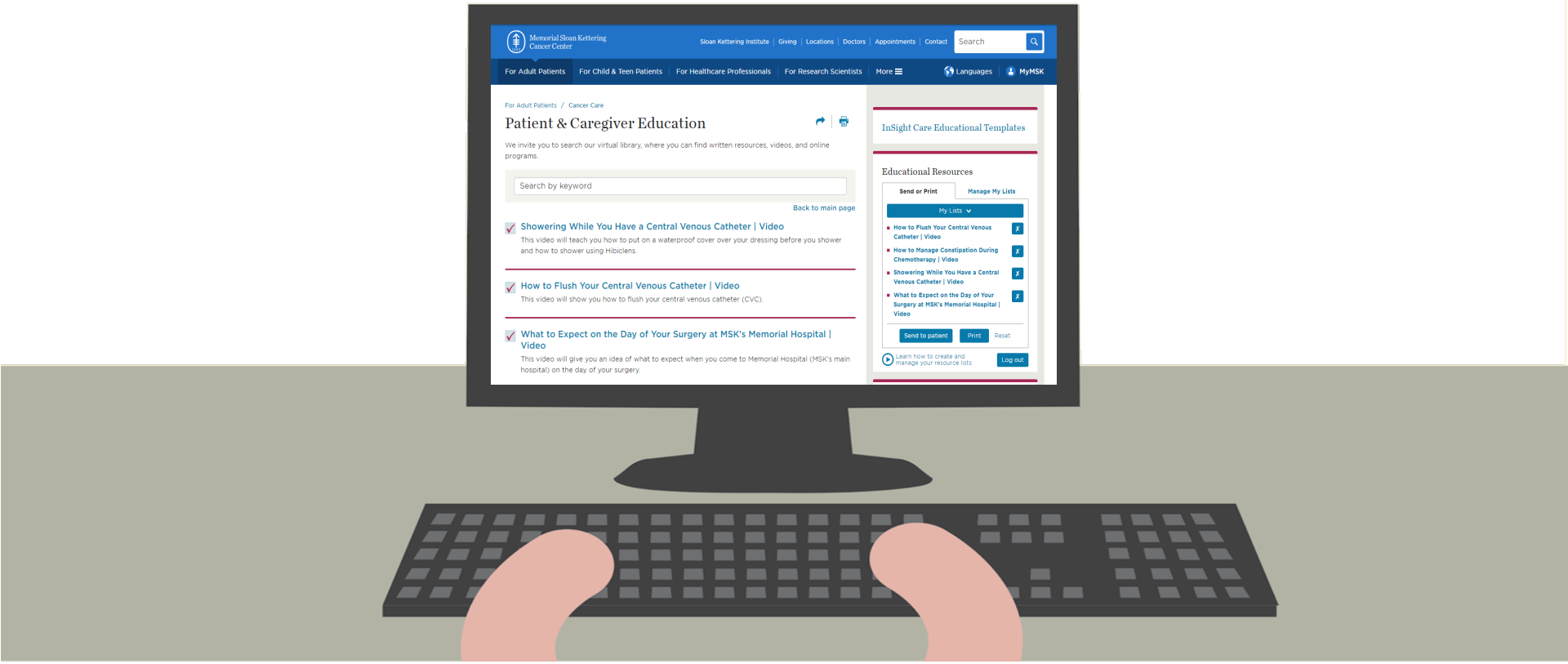
Educational Resource Request Form



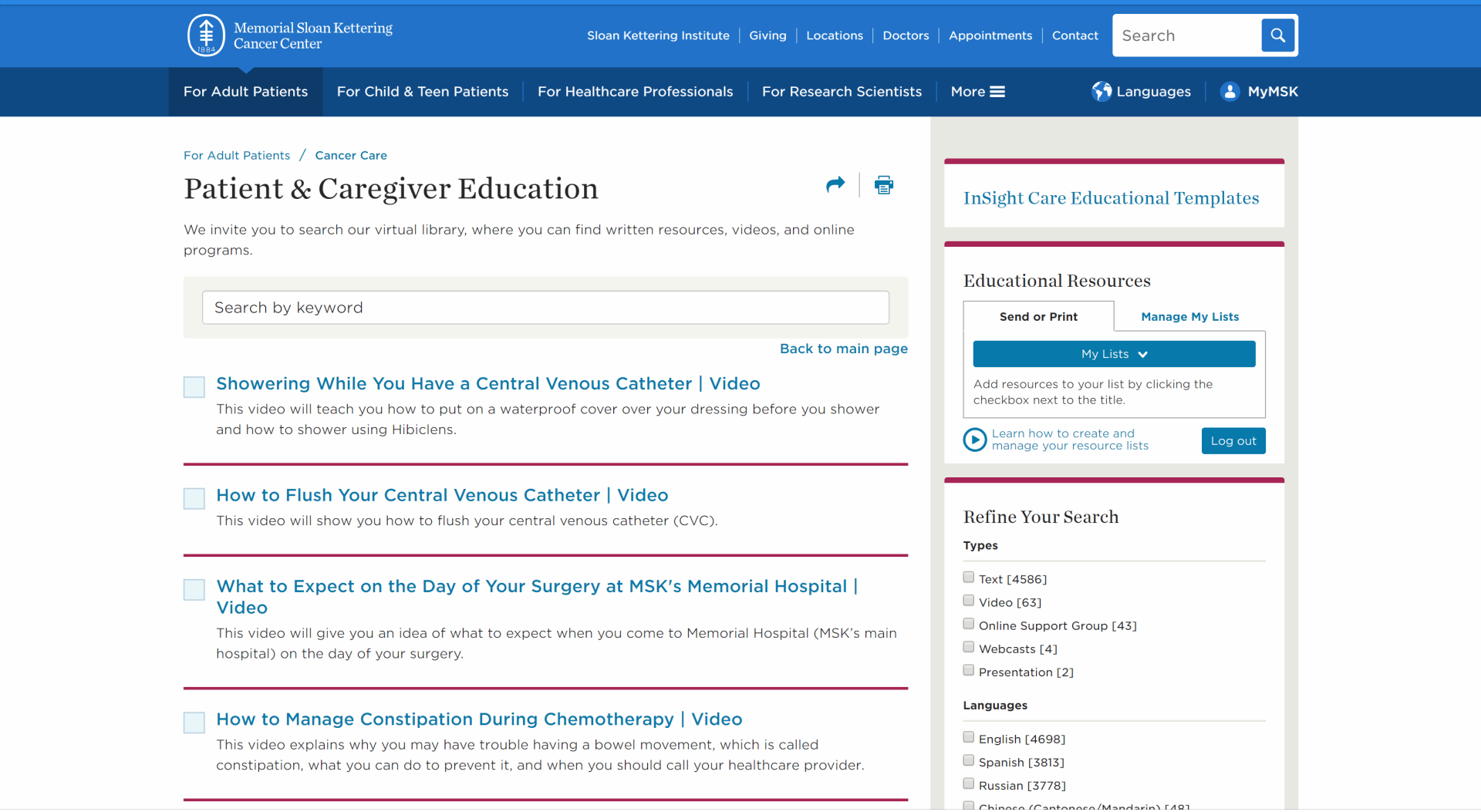
# Distribution

## Drupal 8

Bookmarking



# Distribution

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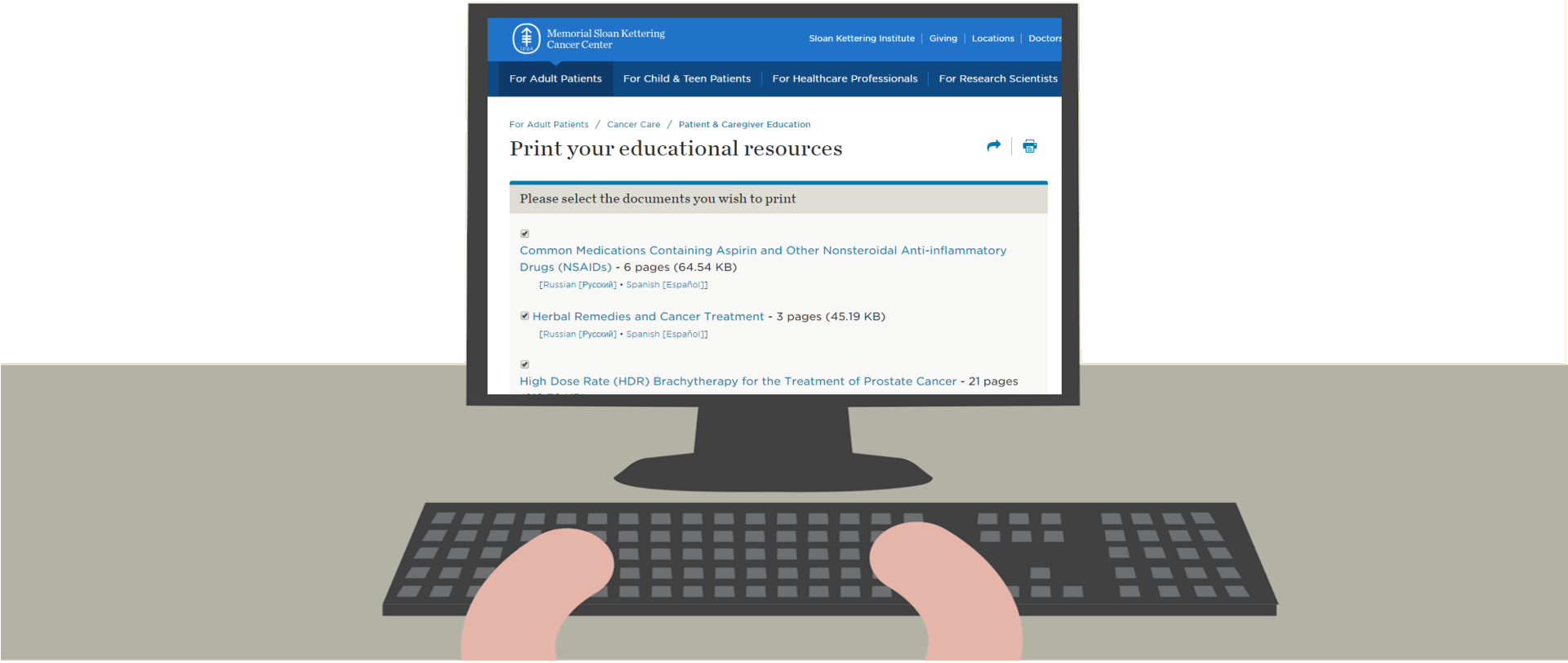
# Distribution

## Drupal 8

Print Bundling



# Distribution

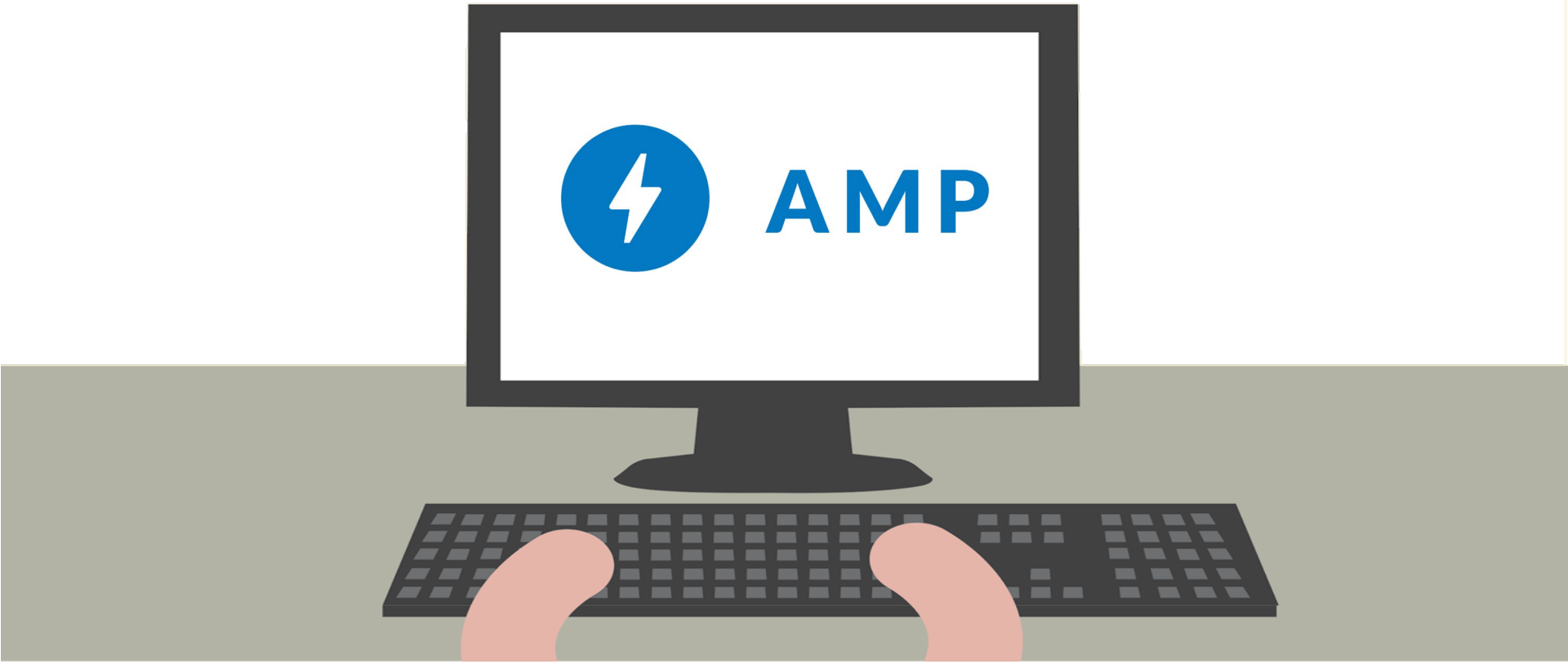
## Drupal 8

MyMSK Patient Portal integration (Send to Patient)

# Distribution

## Drupal 8

Accelerated Mobile Pages (AMP)

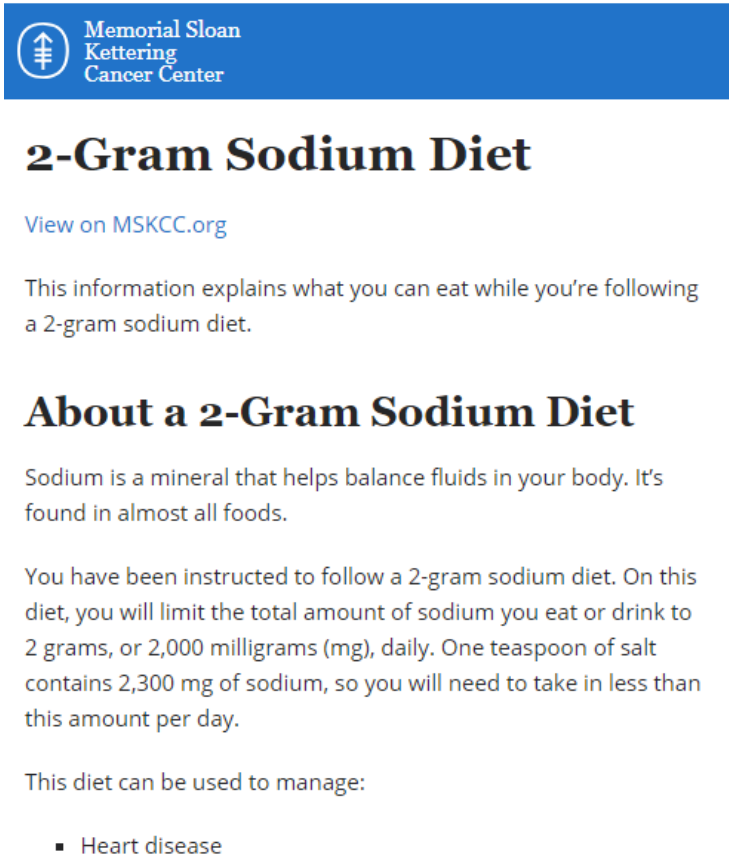


# Distribution

## Drupal 8

Accelerated Mobile Pages (AMP)

- Google backed project
- Helps pages load faster on mobile devices



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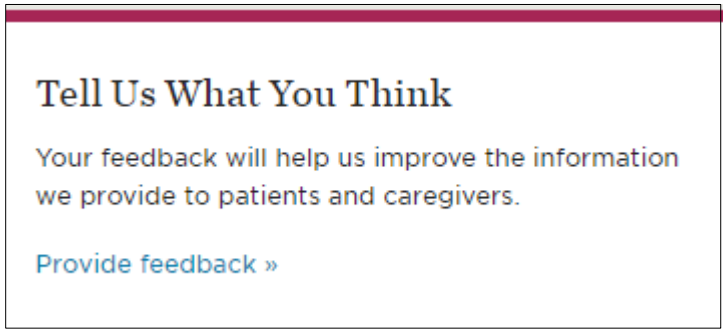
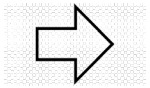
# Feedback

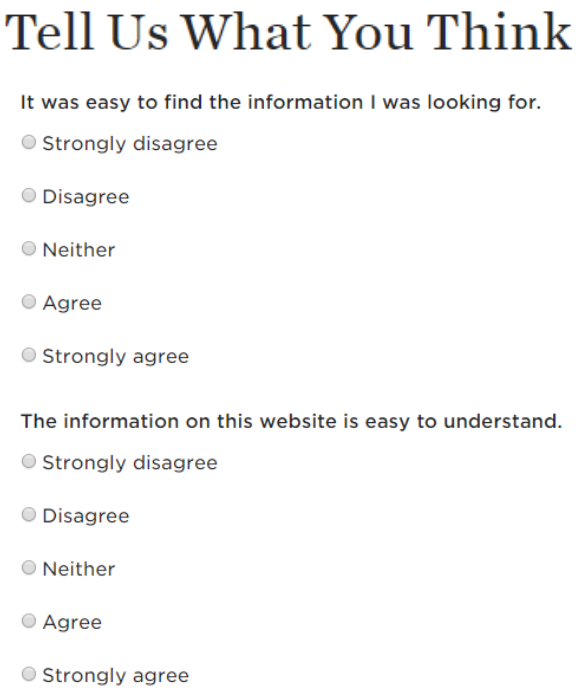
# Feedback

## Drupal 8

Feedback Form





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# Thank You

**Visit us at www.mskcc.org/pe**

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# Questions