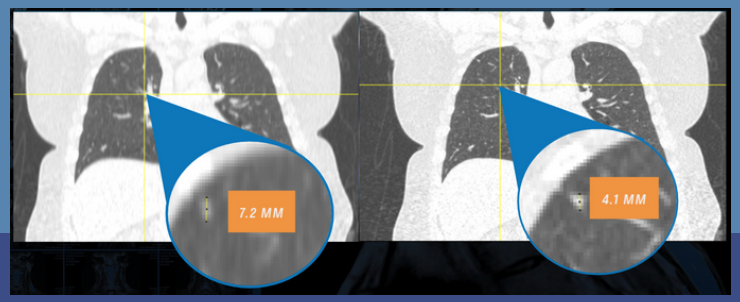
RadUnity

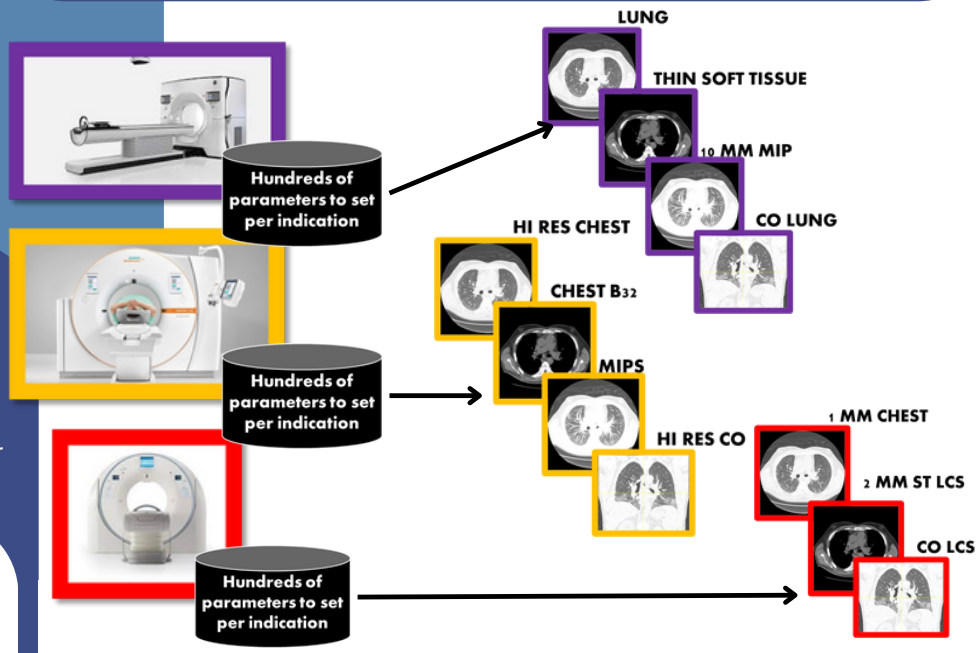
## The Problem

The image below shows two scans of **one** patient's lungs created on the **same day.** Erroneous differences in the measured nodule size in this case were caused by non-uniformity in Computer Tomography (CT) scanner reconstruction parameters.



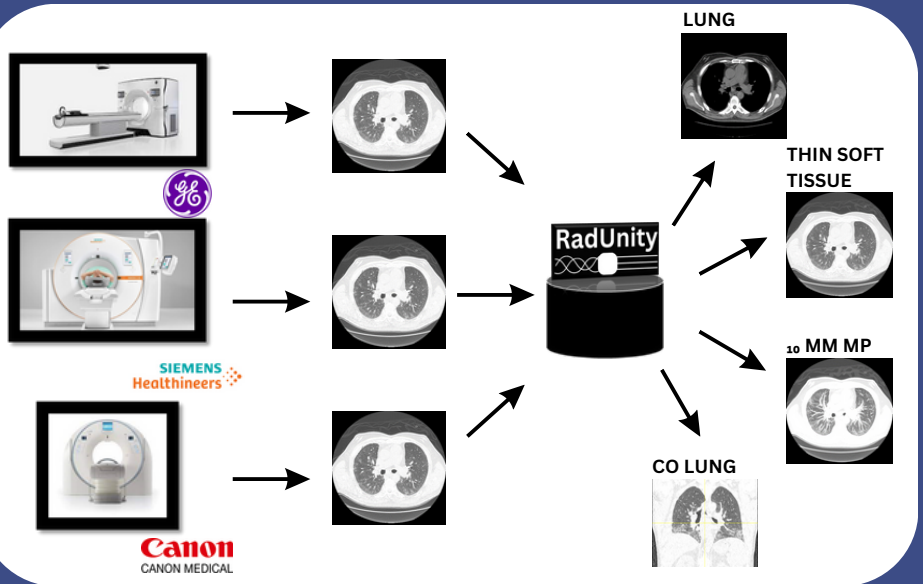

## Current Practice

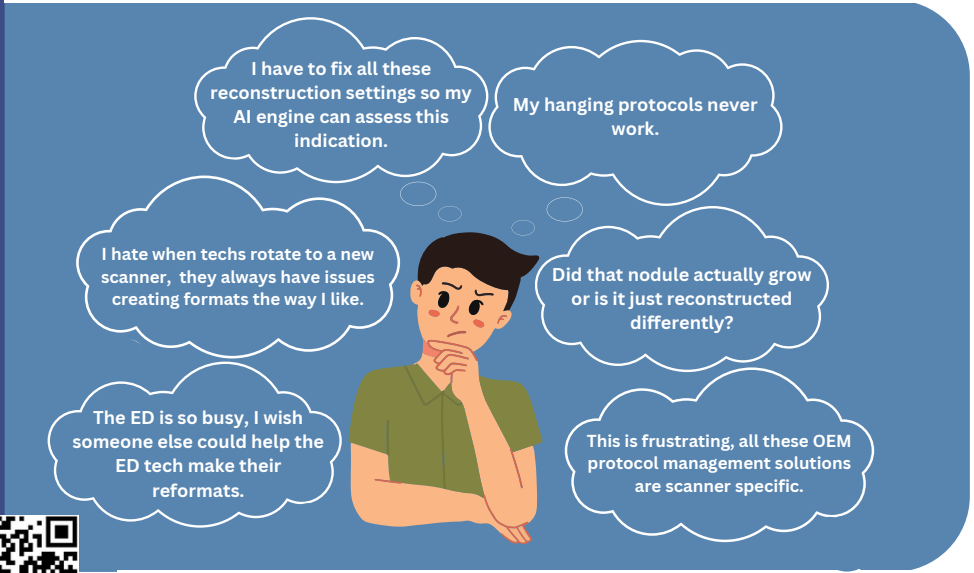
Currently, images are created by modality units supplied by various vendors, reconstructed based on a variety of imaging protocols.[1] These diverse images are then sent to radiologists to hang and interpret.




## RadUnity's solution

RadUnity addresses the problem of inconsistency in medical imaging by centralizing the management of image creation,[2] enabling a site to create a standardized image presentation for any study.




[1] Szczykutowicz, T. P., Rubert, N., Belden, D., Ciano, A., Duplissis, A., Hermanns, A., ... & Saldivar, E. J. (2016). A wiki-based solution to managing your institution's imaging protocols. Journal of the American College of Radiology, 13(7), 822-824.

[2] Szczykutowicz, T. P. (20`9) *System for Harmonizing Medical Imaging Presentation* (US10964074B2). USTPO Patent. https://patents.google.com/patent/US10964074B2/en?oq=10964074

# The RadUnity™ Workflow

## SCAN

**User performs the necessary protocoling, prepping and scanning of the patient based on the order received, acquiring raw data.**

## CENTRALIZED MANAGEMENT

**Reconstructed DICOM data is sent through RadUnity's gateway to a secure environment for centralized reformatting based on an indication specific profile.**

## REFORMAT

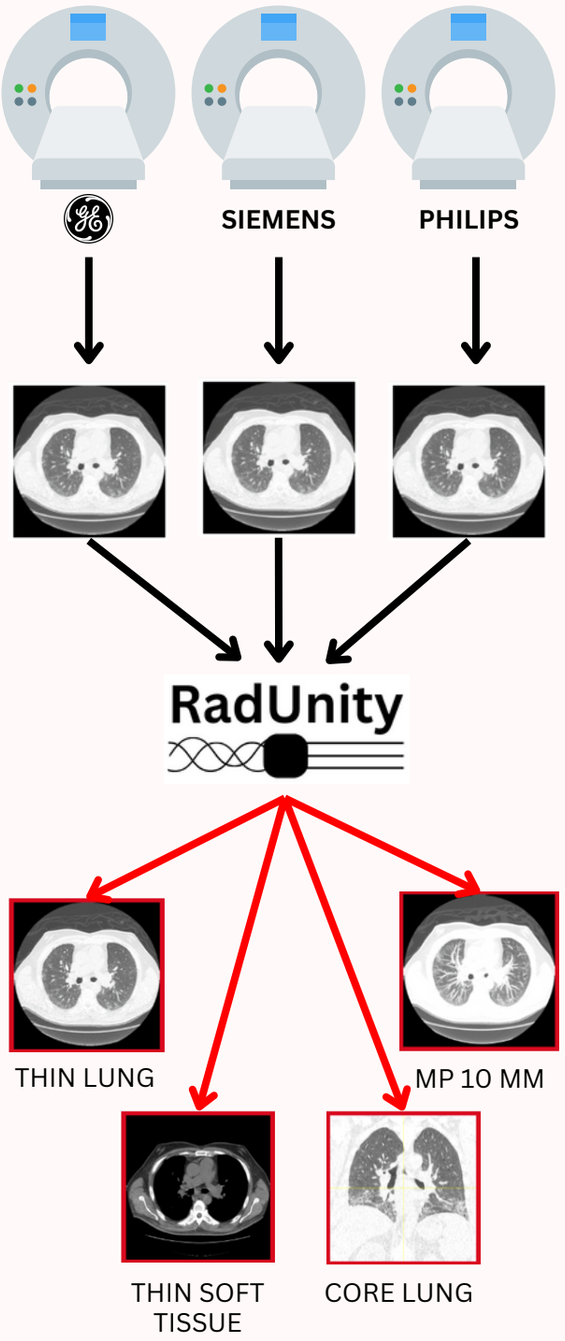
**User launches RadUnity's web-based platform. Users then select the appropriate order, and then choose from predefined profiles. The profiles are indication specific, and define image plane, name, image type, etc., for radiologist interpretation and post processing needs.**

## PACS

**Images reformatted on the cloud will then populate in a site's respective PACS server for viewing.**

## INTERPRETATION

**Radiologists now can view images on PACS with the same look and feel coming from all the scanners they read from.**




Our Software-as-a-Service (SaaS) solution enables a site to tailor image reformatting in a customized manner from any location. Therefore, RadUnity's solution can be applied to images from outside one's institution, as well as on images previously acquired.

Szczykutowicz, T. P. (20`9) *System for Harmonizing Medical Imaging Presentation* (US10964074B2). USTPO Patent. https://patents.google.com/patent/US10964074B2/en?oq=10964074

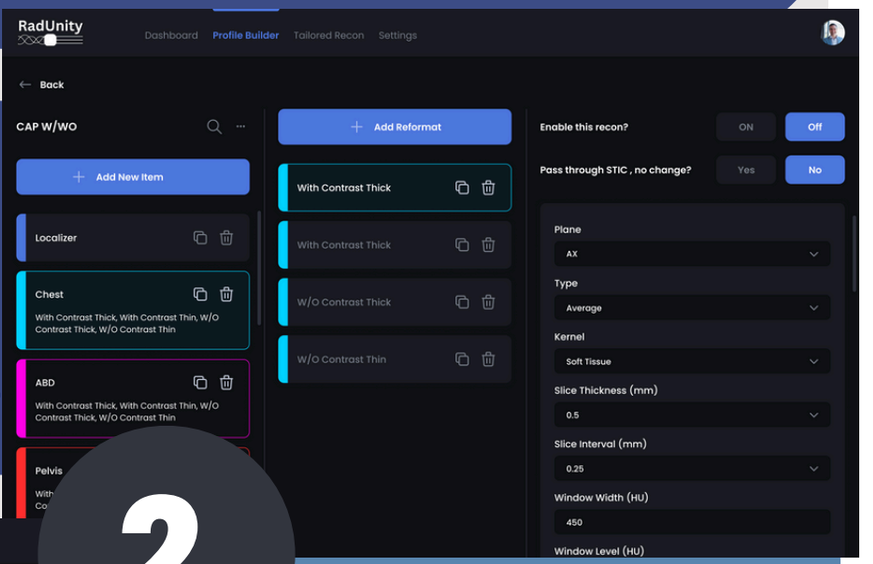
# RadUnity™

RadUnity

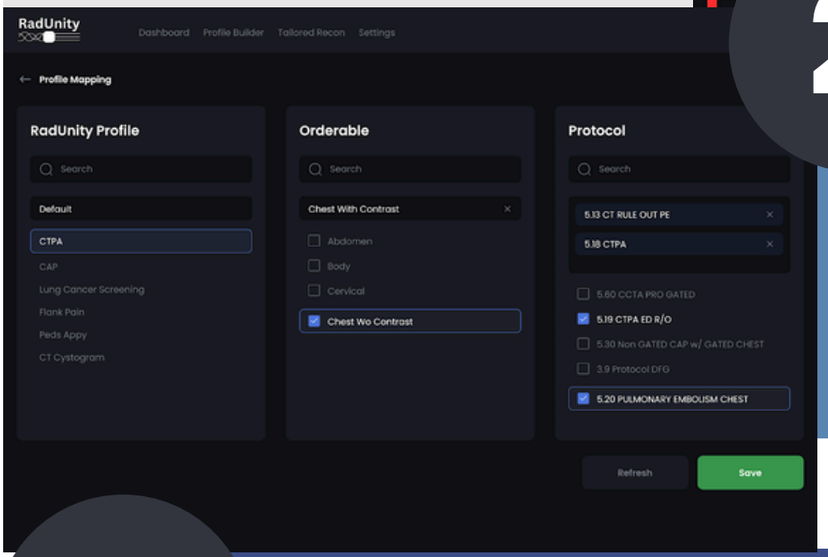
# how it works

## 1

Create an indication specific profile to define the image "look and feel" (i.e., the names, planes, kernels, slice thicknesses, etc.) for image volumes per indication.



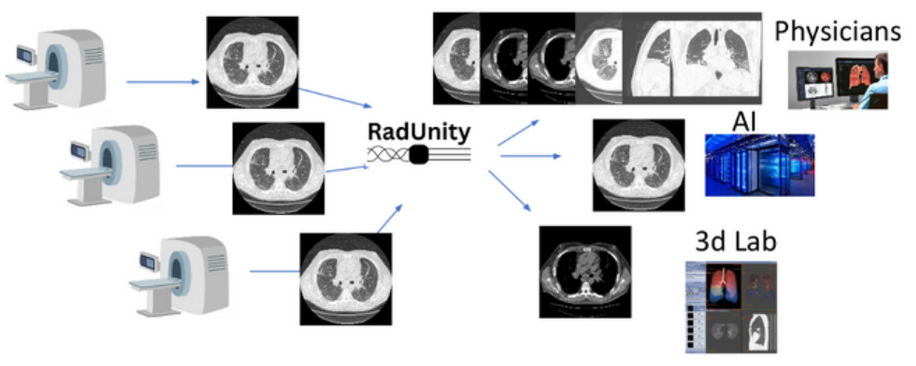

## 2




Link a RadUnity ™ profile to a study description and protocol names so RadUnity™ can associate the correct image reformat profile with the correct exam.

## 3

At scan time, scanning (i.e., data acquisition) is unchanged with the RadUnity solution. Only a thin high resolution (i.e., a bone or lung kernel) image volume is reconstructed on a CT scanner and sent to RadUnity for processing.

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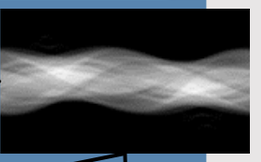
# RadUnity™

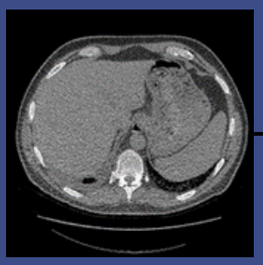
# why it works

Modern CT scanners can make very high resolution thin images. These images are far too noisy for human interpretation. So historically we “thicken them up” and “blur them” to make images palatable to human interpretation. CT OEMs do this via filtering projection data using kernels.



The scanner can make thin high resolution images like this.

Radiologists prefer thicker lower resolution images for most indications.

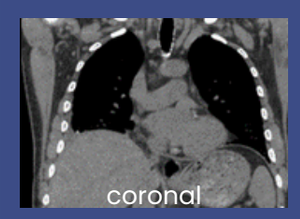


We don't need a CT scanner to transform a high resolution image into an image suitable for radiologist interpretation. One can quickly and easily filter a high resolution image (i.e., bone or lung) into a lower resolution image (i.e., soft tissue).

A thin image volume can be reformatted into other planes. This is exactly what RadUnity does to make non-axial images and thicker axial image volumes.[1]

Going from a high resolution source image to a lower resolution image is easy, one just has to apply a blurring filter. This is ubiquitous on most 3D processing workstations and PACS systems. RadUnity™ duplicates CT OEM projection filtering using image space filtering.[2]

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[1] Szczykutowicz, T. P. (209) System for Harmonizing Medical Imaging Presentation (US10964074B2). USTPO Patent. https://patents.google.com/patent/US10964074B2/en?oq=10964074

[2] Schaller, S., Wildberger, J. E., Raupach, R., Niethammer, M., Klingenbeck-Regn, K., & Flohr, T. (2003). Spatial domain filtering for fast modification of the tradeoff between image sharpness and pixel noise in computed tomography. IEEE transactions on medical imaging, 22(7), 846-853.

**RadUnity is a platform that presents harmonized images from diverse CT data tailored for any radiologist, researcher, or AI tool. Its cloud-based software as a service platform allows centralized specification and management of image reformatting according to predefined user preferences.**

## Same Image Viewing Experience

### Patients

Patients will experience less repeat imaging and reduced diagnostic errors. This is especially important receiving care at low-resourced medical centers, where patients are frequently refered to advanced academic medical centers.

### Technologists

RadUnity allows the user to customize their interaction level, automating repetitive tasks without disrupting the established workflow.

### Radiologists

RadUnity allows radiologists to reclaim time and mental space, providing customizable tools that work in the background to improve user experience with image interpretation and diagnosis.

## Centralized Management

### Technologists

RadUnity software provides more consistency in image reconstruction, as well as the flexibility to automate hanging protocols. This software can support technologists so they may focus more on patient care, rather than image organization.

### Site Administration

Centralized data management and a consistent viewing experience fosters confidence in providers and patients alike, helping to reduce burnout and mitigate guesswork resulting from nonuniformity.

### Radiologists

RadUnity's platform means providers have access to the same image "look and feel" from any location, reducing guesswork and repetitive tasks so radiologists can do what they trained to do: practice medicine.

# RadUnity

## Real Time Reporting

### Radiologists

RadUnity software assists in load balancing through the real time status dashboard. During busy times, users can support one another through performing manual tasks needed for other's scans, regardless of location.

### Technologists

RadUnity can optimize onboarding protocols with our solution for nonuniformity in image reconstruction, enabling new radiologists and technologists to redirect their attention from machine-specific reconstructions so they can focus more on their patients.

### Site Administration

RadUnity's integrated status dashboard may act as a tool that allows providers to maintain control of scan orders, easily prioritize cases, and enhance resource allocation. This software as a service platform has the potential to boost efficiency, reduce turnover, and optimize resource utilization.

## Normalized Data

### AI Vendors

The consistency RadUnity offers AI vendors contributes to optimizing their algorithms related to medical imaging.

### Radiologists

RadUnity software can normalize data from new and previous scans alike, creating a consistent image viewing experience, no matter the source.

### Site Administration

RadUnity fosters uniformity in the image viewing workflow, allowing for easier intra- and intercommunication within and among sites.

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