WHICH ONE ARE WE TALKING ABOUT?

ASSIGNMENT OF NUMERICAL ADDRESSES TO DISTINGUISH FINDINGS IN THE SAME ANATOMICAL LOCATION AND/OR IMAGE

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PURPOSE:

- The identification and communication of information about image findings located in the same anatomical location and/or image can be challenging.

- A solution was developed to automatically assign numerical "addresses" to each finding in an interactive multimedia report to facilitate clear and accurate communication.

Which lesion are we talking about?
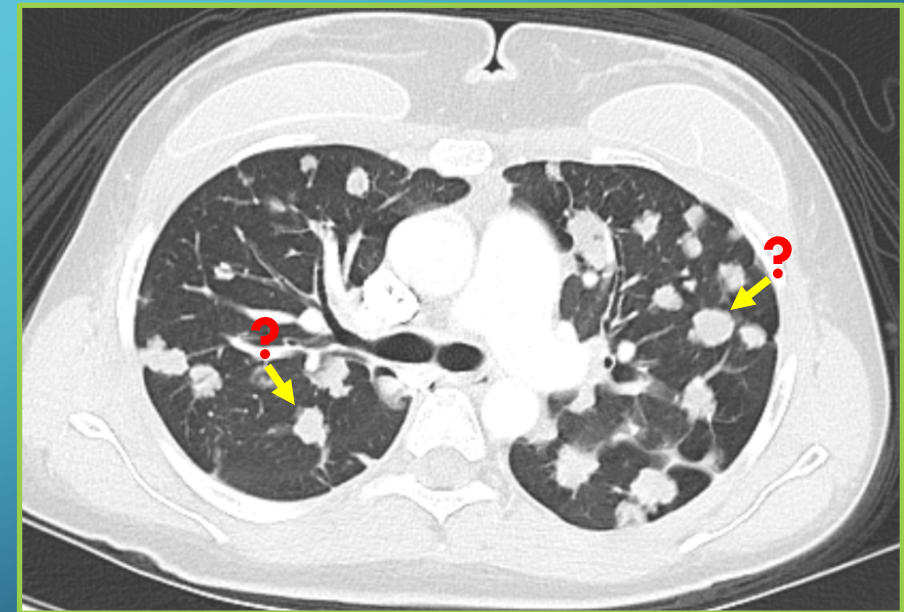
Like finding a needle in a haystack

METHODS:

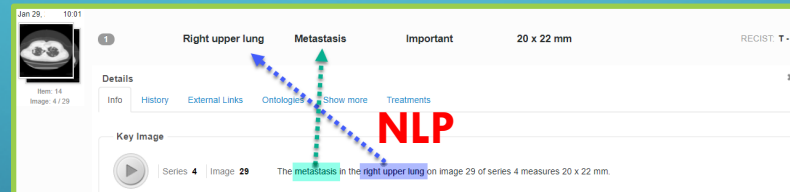The interactive multimedia reporting solution works as follows:

1. Record key images and voice descriptions of findings
2. Tag each finding with anatomy and pathology (diagnosis) using natural language processing (NLP)
3. Assemble multimedia report with related information linked in timelines

Step 1: Record images/voice
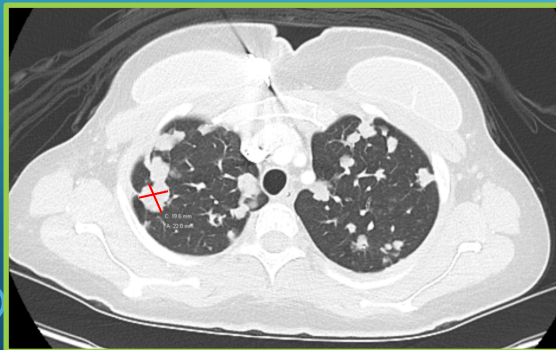
The metastasis in the right upper lung on image 29 of series 4 measures 20 x 22 mm.

Step 2: Tag with metadata

NLP

Step 3: Assemble multimedia report

Finding IDs

Timeline

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
METHODS:

- A "finding" comprises one or more "items" (i.e., key images) linked in a timeline.

- Both findings and items are assigned numerical labels.

Clicking on a finding reveals more details, including a timeline of linked "items."

METHODS:

- Numerical IDs are automatically assigned to each finding **based on when it first appears in a report**.

- Finding IDs help to distinguish multiple findings located in the same anatomical region, especially when labeled with the same metadata (i.e., anatomy, pathology).

- Findings may be sorted in the report based on anatomy, pathology, or finding ID.

The concept is like a street address except findings are arranged anatomically.

Findings resorted by numerical order.

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Another example of where numerical IDs help to distinguish findings labeled with the same metadata

#1 Right Vastus lateralis muscle

#3 Right Vastus lateralis muscle

#39 Right Adductor magnus muscle
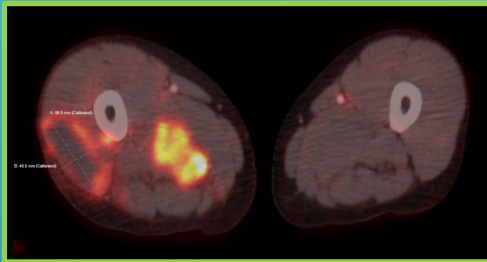
#2 Right Adductor magnus muscle
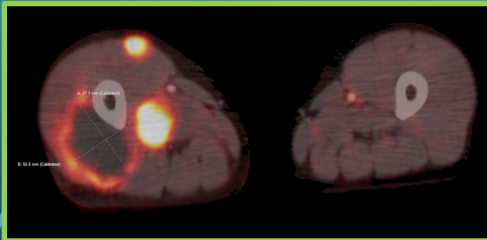
Lower extremity

May 5, 11:54	40	Right	Rectus femoris muscle	Metastasis	Important	17.9 x 23 mm
Item: 150 Image: 1201 / 382						
May 5, 11:54	1	Right	Vastus lateralis muscle	Metastasis	Important	40.6 x 86 mm
Item: 134 Image: 1201 / 366						
May 5, 11:54	3	Right	Vastus lateralis muscle	Metastasis	Important	65.6 x 87.1 mm
Item: 133 Image: 1201 / 380						
May 5, 11:54	39	Right	Adductor magnus muscle	Metastasis	Important	86.1 x 27.4 mm
Item: 149 Image: 1201 / 353						
May 5, 1 11:54	2	Right	Adductor magnus muscle	Metastasis	Important	39.8 x 68.6 mm
Item: 143 Image: 1201 / 367						
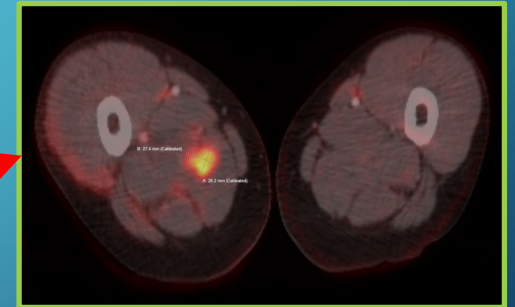
User-defined labeling

- In addition to findings IDs, user-defined labeling is available.

- In this example, brain MR images are reported, and radiation oncology codes used for gamma knife planning are added for correlation.

- Thus, several means exist for distinguishing findings in a multimedia report.

Rad Onc 1LP1 = 1st lesion, Left parietal lobe, 1st treatment

RESULTS:

- The interactive multimedia reporting system is in use at our institution where 2,342 reports with 11,448 findings have been generated using this process.

- The concept of applying numerical addresses to image findings helps to describe specific lesions when multiple lesions exist in the same location, particularly during surgical planning or when correlating lesions that have undergone local therapy (e.g., ablation or stereotactic radiosurgery).

- This simple yet powerful concept facilitates clear communication and eliminates ambiguity that may exist with conventional radiology reporting.

CONCLUSION:

Automatic assignment of numerical "addresses" to image findings in an interactive multimedia report helps to distinguish lesions in the same anatomical region and improve the clarity of radiology communication.