

Instructions for Reporting the *Numeric Score*

The *Numeric Score* is a rating given to each case that reflects your level of suspicion for cancer.

The *Numeric Score* we are asking you to provide is not universally part of a standard clinical report. You may not be trained to provide a *Numeric Score*. The purpose of reporting a *Numeric Score* is to provide more information than just the recall decision; it is meant to provide more robust, quantitative, and statistically powerful data for evaluating an imaging technology in a non-clinical setting.

The *Numeric Score* arises from the following question:

Given two cases, which one is more suspicious for cancer?

Hopefully, a case you would recall would be more suspicious than a case you would not recall. What if the two cases in question were both cases you would recall? Could you decide which one is more suspicious for cancer? What if the two cases in question were both cases you would not recall? Could you rank one as more suspicious than the other? Could you take a stack of cases and lay them out on a conference table, sorting them from the least suspicious to the most suspicious (allowing for some ties)?

Assuming you can compare cases in terms of suspicion for cancer, a rating of suspicion for cancer can be given to every case. The *Numeric Score* is this rating.

The typical mammographer/radiologist can provide a *Numeric Score* for cases they would recall. Their *Numeric Score* is analogous to or correlated with (but not necessarily scaled to) other rating concepts:

- The level of confidence that the case is cancer.
- The likelihood the case is cancer.

The typical mammographer/radiologist struggles with reporting a *Numeric Score* for cases they would not recall. They are not generally trained to report a *Numeric Score* for these cases. When asked to report a rating of suspicion for cancer for a case they would not recall, the response is that there is no suspicion of cancer. If there was suspicion of cancer, the case would be recalled.

The purpose of this document is to provide language, concepts, and tools to help you report a *Numeric Score*. The document begins by describing the *Numerical Score* for cases you would recall, then it treats the cases you would not recall, and concludes with general remarks on being quantitative.

***Numeric Score* for a Case You Recall**

For a case you recall, the *Numeric Score* reflects how suspicious for cancer the findings are that led to your decision to recall the case.

- 1 is the lowest *Numeric Score* for recalling a case. It indicates that, compared to all the cases you have ever recalled, this one is the least suspicious for cancer.
- 100 is the highest *Numeric Score* for recalling a case. It indicates that this case is the most suspicious case you have ever seen.

Consider the following sequence of questions as steps that can be followed for the purpose of being more quantitative in reporting your *Numeric Score* for cases you recall:

1. Given all the women you would recall, is this patient more or less suspicious? If the patient is more suspicious, the *Numeric Score* should be above 50.
2. Given all of the women that you would recall, which quartile would you put this patient in?
 - a. Are the findings (appearance) likely to be benign? If so, perhaps your *Numeric Score* should be 1-25?
 - b. Are the findings (appearance) highly suggestive of cancer? If so, perhaps your *Numeric Score* should be 75-100.
 - c. Are the visual cues somewhere in the middle?
3. On average, out of 100 women (or 1,000 women) that you would recall, how many would be more suspicious than this patient? Throughout your participation in this study try and be more quantitative.

For example: You vaguely recall another patient that you scored as 80. This one evokes a similar score in your mind, but you believe this patient is a bit more suspicious. Perhaps your *Numeric Score* should be 83. Scoring is challenging and unfamiliar; just do your best.

Numeric Score for a Case You Do Not Recall

The *Numeric Score* reflects how transparent the patient images are, how possible it is for a lesion to be masked by dense tissue, the amount of symmetry, the number of abnormal findings. How likely is it that this patient is normal?

- 1 is the lowest *Numeric Score* based on the visual characteristics of the current patient's images compared to those of all the women that you have *NOT recalled* in the past. This may be a fatty breast with absolutely no asymmetries or isolated calcifications.
- 100 is the highest *Numeric Score* based on the visual characteristics of the current patient images compared to those of all the women that you have *NOT recalled* in the past. This may include an extremely dense breast or a heterogeneous breast with scattered non-clustered calcifications.

The *Numeric Score* is analogous to or correlated with (but not necessarily scaled to or in the same direction as) other rating concepts:

- A rating of how normal/negative the case looks.
- A level of comfort, or confidence, that the case is normal/negative.
- A level of certainty that a mammogram is benign.

Consider the following sequence of questions as steps that can be followed for the purpose of being more quantitative in reporting your *Numeric Score*:

1. Given all the women you would NOT recall, is this patient more or less normal? If the patient is more normal, the *Numeric Score* should be below 50.

2. Given all of the women that you would NOT recall, which quartile would you put this patient in?
 - c. Are there no dense areas and no apparently benign findings? If so, perhaps your *Numeric Score* should be 1-25?
 - d. Are there dense areas or apparently benign findings, but not enough to prompt a decision to recall? If so, perhaps your *Numeric Score* should be 75-100.
 - e. Are the visual cues somewhere in the middle?
3. On average, out of 100 women (or 1,000 women) that you would NOT recall, how many would be more normal than this patient? Throughout your participation in this study try and be more quantitative.

For example: You vaguely remember another case that you scored as 60 that is similar to this one except this one has more dense tissue and some asymmetry across breasts. Perhaps your *Numeric Score* should be 76. Scoring is challenging and unfamiliar; just do your best.

Being Quantitative

You should attempt to make your *Numeric Score* as quantitative as possible in terms of relative comparisons: a case given a *Numeric Score* of 45 should be more suspicious than a case given a *Numeric Score* of 35.

If you use a *Numeric Score* rating more than once, you are indicating that there are no features indicating one case is more suspicious than another.

You should try and space out your *Numeric Score* ratings to allow for a new case that has a *Numeric Score* in between.

Being quantitative is not easy. Do your best. If you are only comfortable using 10, 20, 30, ... That's fine.

Good Luck!