Supplementary Table: Summary of metrics for contour comparison

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| ***Metric type*** | ***Example*** | ***Description*** | ***Advantages*** | ***Disadvantages*** |
| Volume-based metrics | Volume [1, 16, 32, 34-35] | Commonly calculated by multiplying the number of voxels within a contour by the size of the voxel | Easy to calculate | No information provided on location of contours |
|  | Centre of volume/mass [1-2, 16, 34-35] | Provides a single point representing the location of a contour | Provides information on differences in volume location | Contours with different volumes may have the same centre of volumeCentre of volume may lie outside of the volume for curved structures  |
| Volume overlap metrics | Conformity/concordance index [1-2, 16, 34-35]DICE similarity coefficient [2, 16, 18, 34-35, 37]Jaccard similarity coefficient [34-35, 37] | Measure of the relative overlap of contours, taking into account their intersection and unionPresented as a ratio | Provide a single measurement with a description of both volume and positionComparisons can be made against a reference contour | No information provided on how contours vary in size, shape or location in absolute termsNo information provided on location of variation between contoursMay be less reliable or lack discrimination for very small or large volumes respectively |
| Distance-based metrics | Maurer distance [36] | Euclidian (straight line) distance between points on two contours | Provides a measure of the maximum and minimum distance between contours | No information provided on how contours vary by volume, size, shape or location |
|  | Hausdorff distance [16, 37] | Maximum distance between points on contours (equivalent to the maximum Maurer distance) | Provides a quantitative measure of the maximum distance between contours | As for Maurer distance plus:Sensitive to outliers- calculation of an average Hausdorff distance may mitigate this |
|  | Average surface distance [16, 35] | Average distance between points on contours are determined | Provides a single measure of the average distance between contours | Use of an average value may mask areas of incorrect contouring |
|  | Percentage of surface area differing (PSAD) [33] | The percentage of a contour which varies beyond a defined extent | Provides information on how much a contour would need to be modified compared to another | No information provided on the magnitude of contouring errors, only whether they are smaller/larger than the defined extent |
| Dimension | Dimension derived from encompassing dimension or from the centre of volume [1, 16] | Dimension of a structure determined along X, Y and Z axes | Provides information on size and approximate shape of a contour | May be misleading for irregularly shaped contours |
| Shape/surface-based metrics | Nearest point method [1] | Comparison of the surface/shape of 3 dimensional structures | Provides topological information in addition to distance between contours | No information provided on contour volumeChallenges exist with analysis of asymmetrical shapes |
| Statistical measures of agreement | Cohen’s kappa [34, 37]Inter/intra-observer reliability coefficients [34, 37] | Measure of chance-corrected agreement between two or more observers | Cohen’s kappa provides a measure of agreement robust to that caused by chanceInter/intra-observer reliability coefficients provide measures of inter/intra-observer agreement, reliability of results and minimum number of observers required | Cohen’s kappa designed for use with ordinal or nominal types of data |