THREE-DIMENSIONAL MANDIBULAR REGIONAL SUPERIMPOSITION: AN EVALUATION OF THE MENTAL AND MANDIBULAR FORAMINA AS NATURAL REFERENCE STRUCTURES

by

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DEDICATION

I would like to thank my beloved parents whose open-mindedness, intelligence, love, and support made me who I am today. To them, I dedicate this thesis.

ABSTRACT

Objective: The purposes of this study were 1) to assess the reliability of identification of the mental and mandibular foramina on CBCT images and 2) to evaluate their spatial stability relative to each other during normal growth. **Methods:** Forty-one subjects (18 males and 23 females) with longitudinal CBCT scans, ranging from 7-14 years of age at T1, were selected. The minimum time interval between T1 and T2 CBCT scans was three years and the largest interval was 5.7 years (mean interval of 3.7 ± 0.6 years). Head orientation was standardized for the CBCT images using cranial base foramina to establish a 3D reference coordinate system. The right and left mental and mandibular foramina landmarks were identified on T1 and T2 scans and their coordinate values collected. To assess reliability, landmarks were located three times with a three-week interval between each session. Measures of dispersion were calculated for each landmark in all three dimensions. Distances and angles between the four landmarks were also calculated for each subject at T1 and T2. **Results:** Variations in the estimates for the location of the mental foramina were all less than 0.7 mm, ranging from 0.0 mm to 0.6 mm, with the distribution of error being greater along the transverse (X) and vertical (Y) axes compared to the anterior-posterior (Z) axis. Variations in the estimates for the location of the mandibular foramina were all less than 0.9 mm, ranging from 0.0 mm to 0.9 mm, with the distribution of error being greater along the Y-axis compared to either the X- or Z-axes. Distances increased between all paired combinations of landmarks. Distances between the mental foramina changed the least and approximated changes along the X-axis. Angular measures were stable except in four subjects, all of whom had significant asymmetric mandibular growth.
Conclusions: 1) The mental foramina change the least in position, displaying slight remodeling activity in the transverse (X) plane. 2) The mandibular foramina appear to remodel posteriorly, relative to the mental foramina, with the distance between them also increasing. 3) The mental foramina can be reliably identified on CBCT images and may possibly be used as anterior-posterior registration points for three-dimensional mandibular regional superimposition.

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LITERATURE REVIEW

Since its introduction by B. H. Broadbent in the United States and by H. Hofrath in Germany in 1931, the cephalogram has been used as a standard diagnostic tool for orthodontists and has remained relatively unchanged to present day. Growth changes and orthodontic treatment response are measured by superimposition of serial tracings of cephalograms on relatively stable reference structures or regional contours. Numerous methods of superimposition have been introduced over the years and depending on the reference system used, they can lead to different interpretations of craniofacial changes taking place over time.

Early cephalometric studies of mandibular growth used the outline of the inferior border of the mandible as the reference site of superimposition (Broadbent, 1931). However, due to its curved outline, superimposition on the inferior border was difficult. In response, Downs introduced a new method using a straight line from the lowest point on the external contour of the symphysis to the midpoint at the gonial angle to represent the lower border of the mandible (Downs, 1948).

Growth changes were measured by superimposing tracings along this line with registration at the symphysis.

However in the late 1940's, animal studies on mandibular growth utilizing vital stain dye techniques revealed that the lower border of the mandible was actively remodeling. Enlow, through histological examination of resorptive and depository areas of the mandibular surface, also found that the gonial region of the mandible becomes relocated posteriorly (Enlow, Harris, 1964). Bone formerly at the site of the gonial angle becomes relocated into the area of the antegonial notch. The antegonial notch, in turn, becomes incorporated into the body of the mandible. Enlow's studies revealed that there is apposition on the anterior part and resorption on the posterior part of the lower border and this remodeling activity leads to a change in shape of the mandibular corpus over time. Therefore, superimposition of serial films along the inferior border of the mandible, erroneously show "a tendency to move forward (relative to tracings of earlier films) due to the change in the curvature of the inferior border of mandible."(Gu, McNamara, 2008)

In 1975, Ricketts introduced his four-position cephalometric superimposition technique to isolate dental from skeletal changes. He used two points to measure overall growth of the craniofacial complex. Position one superimposed Basion-Nasion line on the Pterygoid point. Position two superimposed Basion-Nasion on Nasion. Positions three and four represent the maxillary and mandibular teeth respectively. Position four specifically uses the corpus axis, a reference line formed between the protuberance menti (Pm point) and the Xi point for mandibular superimposition. Ricketts introduced the Xi point as a constructed point located in the center of the mandible representing the mandibular foramen and center of rotation of the mandible (Ricketts, 1975).

The most widely accepted superimposition technique to date was introduced by Bjork who identified stable structures in the mandible using metallic implants in the jaws. Bjork's classic implant studies identified natural reference structures that remained in stable position during growth. Superimposition of serial cephalograms could be carried out on these stable structures as substitutes for metallic implants (Bjork, 1955, 1963).

For the mandible, these structures are: 1) the anterior contour of the chin; 2) the inner contour of the cortical plate at the lower border of the symphysis menti; 3) any distinct trabecular structure in the symphysis menti; 4) the contour of the mandibular canal; and 5) the lower contour of mineralized tooth germs before root development begins (Bjork, 1969, 1983). Bjork's studies also confirmed that the inferior border and angle of the mandible undergoes extensive differential remodeling during growth, confirming that this area was an invalid structure for superimposition (Bjork, 1969, 1983).

Springate and Jones compared Rickett's and Bjork's mandibular superimposition methods and found that they yielded different interpretations of mandibular growth. Bjork's natural reference structures indicated changes that were consistent with those found with use of metallic implants. However, Ricketts' corpus axis displayed statistically significant differences for four landmarks (Co, Go, Mbc, I). It was concluded that Bjork's method was preferred to Ricketts' for growing subjects (Springate, Jones, 1998).

Presently, the American Board of Orthodontics advocates a method for mandibular superimposition

influenced by Bjork's studies. The ABO's method is "to register on the internal cortical outline of the symphysis with the best fit on the mandibular canal to assess mandibular tooth movement and incremental growth of the mandible" (American Board of Orthodontics, 2013). Matthews and Ware conducted another longitudinal mandibular growth study utilizing implants. They concluded that "there do not appear to be truly fixed anatomic reference points to be found during mandibular growth" (Matthews, Ware, 1978). Chin point at pogonion was found to be the most stable structure. Their study also recognized the limitation of two-dimensional (2D) radiographs, primarily the difficulty in consistently distinguishing between right and left structures.

Difficulty in locating, tracing, and superimposing natural reference structures on 2D cephalograms leads to flawed analysis of growth and treatment results (Cook, Gravely, 1988). To date, cephalometric radiography has remained the standard for evaluation of skeletal, dental, and soft tissue changes in both clinical and research settings. However, the lateral cephalogram is a 2D representation of a three-dimensional (3D) structure. In addition to the exclusion of the third dimension, 2D

radiographs have many other limitations. These include overlapping of structures, magnification, geometric distortion, and an increase in landmark identification error (Adams et al., 2004) (Spolyar, 1987). Unilateral information regarding growth or treatment effects is lost through averaging of bilateral structures. Such information is particularly relevant in cases of asymmetry.

Cephalograms are also sensitive to changes in head rotation, which cause differences in image position for bilateral structures. Additionally, differences in distance from the x-ray film cause differences in image size. Spolyar quantified the amount and direction of head positioning error using metallic implants. He found significant head positioning error in 85% of serial cephalograms studied with an average error of 1.59 degrees. An example given in his study showed that a 1.59-degree error in head position equated to a 3.52mm variation in the relative position of the gonial angle (Spolyar, 1987).

The introduction of Cone Beam CT (CBCT) into dentistry has provided an opportunity to study craniofacial growth in three dimensions without

distortion effects due to head position. CBCT images, unlike 2D cephalograms, can be compared with greater accuracy and precision since they are true 1-to-1 measurements of craniofacial anatomy (Harrell et al., 2002).

Use of implant markers is considered to be the most valid method of superimposing cephalometric tracings or for identifying natural reference structures which may be used as substitutes. However, there haven't been any longitudinal CBCT studies utilizing metallic implants to date. There is also a general lack of research in normal mandibular growth and treatment effects in three dimensions.

3D superimposition studies are currently in their stage of infancy and generally there have been two methods of approach. Current techniques have either utilized registration points or mathematical algorithms. Generalized Procrustes Analysis is the primary example of use of a mathematical alogorithm for superimposition purposes (Goodall, 1991). It is a statistical method for analyzing geometric shape changes in landmark configurations. This method has been applied to analyze changes in growth or treatment effects in the mandible

using 3D images in several studies (Andresen et al., 2000)(Hilger et al, 2003) (Cevidanes et al, 2005).

The main disadvantage of Generalized Procrustes Analysis' use for superimposition is the fact that it does not differentiate between growth and drift. These studies investigate the overall shape change of the mandible, which is not a true representation of how the mandible grows in its anatomical position.

Recent techniques on 3D superimposition involve best fit of natural reference structures, based on a voxel-based intensity registration method. The grayscale level intensity of each voxel in the natural reference structure is registered for longitudinal CBCT data sets and compared to each other. Distance changes over time are calculated between the surfaces of the 3D models, and the location and magnitude of these craniofacial changes are displayed through color maps (Cevidanes et al., 2006, 2010). To date, these techniques have been restricted to superimposition of the anterior cranial base and more studies are needed on 3D regional superimposition.

CBCT technology presents an opportunity to gain a better and more accurate understanding of mandibular growth. A method to superimpose the mandible in three

dimensions will allow evaluation of the left and the right sides of the mandible separately which would be particularly useful in cases of dental or skeletal asymmetries. However, 3D mandibular regional superimposition will not be any better unless the method of superimposition is accurate and reliable. It is imperative that relatively stable landmarks, which can be reliably identified, be used as reference structures.

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STATEMENT OF OBJECTIVES

The purpose of this study was to evaluate the suitability of the mental and mandibular foramina as natural reference structures for three-dimensional regional mandibular superimposition during growth. This analysis involved three objectives:

1) Evaluate the reliability of plotting the right and left mental and mandibular foramina on CBCT cross-sectional slices.

2) Determine the distances and angles between the landmarks for pre- (T1) and post-treatment (T2) images.

3) Compare T1 and T2 distance and angle measurements to evaluate the landmarks' spatial stability relative to each other in three dimensions.

Three-Dimensional Mandibular Regional Superimposition: An Evaluation of the Mental and Mandibular Foramina as Natural Reference Structures

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ABSTRACT

Objective: The purposes of this study were 1) to assess the reliability of identification of the mental and mandibular foramina on CBCT images and 2) to evaluate their spatial stability relative to each other during normal growth.

Methods: Forty-one subjects (18 males and 23 females) with longitudinal CBCT scans, ranging from 7-14 years of age at T1, were selected. The minimum time interval between T1 and T2 CBCT scans was three years and the largest interval was 5.7 years (mean interval of 3.7 ± 0.6 years). Head orientation was standardized for the CBCT images using cranial base foramina to establish a 3D reference coordinate system. The right and left mental and mandibular foramina landmarks were identified on T1 and T2 scans and their coordinate values collected. To assess reliability, landmarks were located three times with a three-week interval between each session. Measures of dispersion were calculated for each landmark in all three dimensions. Distances and angles between the four landmarks were also calculated for each subject at T1 and T2.

Results: Variations in the estimates for the location of the mental foramina were all less than 0.7 mm, ranging from 0.0 mm to 0.6 mm, with the distribution of error being greater along the transverse (X) and vertical (Y) axes compared to the anterior-posterior (Z) axis. Variations in the estimates for the location of the mandibular foramina were all less than 0.9 mm, ranging from 0.0 mm to 0.9 mm, with the distribution of error being greater along the Y-axis compared to either the X- or Z-axes. Distances increased between all paired combinations of landmarks. Distances between the mental foramina changed the least and approximated changes along the X-axis. Angular measures were stable except in four subjects, all of whom had significant asymmetric mandibular growth.

Conclusions: 1) The mental foramina change the least in position, displaying slight remodeling activity in the transverse (X) plane. 2) The mandibular foramina appear to remodel posteriorly, relative to the mental foramina, with the distance between them also increasing. 3) The mental foramina can be reliably identified on CBCT images and may possibly be used as anterior-posterior registration points for three-dimensional mandibular regional superimposition.

INTRODUCTION

Serial superimposition of lateral cephalograms has been a powerful tool for understanding normal facial growth as well as treatment effects produced by various orthodontic, orthopedic, and surgical interventions. However, cephalograms cannot show growth changes in all three dimensions of space. Cone Beam CT imaging allows researchers and clinicians alike to view the right and left sides of the craniofacial structures clearly as they are not superimposed on each other as they are in a planar cephalometric film. Additionally, anatomical landmarks such as nerve foramina, which are not visible on cephalograms, are visible on CBCT images. However, maximizing the impact of CBCT imaging in dentistry requires new methods for superimposition in 3D.

Traditionally, three areas of superimposition are useful in orthodontics: 1) cranial base, 2) maxilla, and 3) mandible. Superimposition on the cranial base is used to assess overall growth and treatment changes in the maxilla and mandible with respect to the cranial base. Regional superimposition on the maxilla or mandible should yield new information on the patterns of remodeling as well as changes in the dentition. One of the first steps in designing a system for superimposition in 3D is to identify suitable landmarks for registration of the images. Ideally, these landmarks should not change at all with growth and development. The present study will explore the suitability of using the mental and mandibular foramina in regional superimposition of CBCT images of the mandible.

The inferior alveolar nerve enters the mandibular foramen, travels through the body in the mandibular canal and exits at the mental foramen at which point the nerve is known as the mental nerve. The mental foramen is an opening on the lateral part of the body of the mandible situated bilaterally and inferior to the second premolar.[1] The mandibular foramen is the opening on the medial surface of the ramus for the transmission of the inferior alveolar nerve and vessels.[1] It opens upwards postero-inferior to the lingula.

Accurate identification of curved anatomical structures on CBCT images has been known to be challenging depending on the landmark.[2] Neiva et al.[3] found that the mean height of the mental foramen was 3.47 ± 0.71mm and the mean width 3.59 ± 0.8mm. The average diameter of the mandibular foramen was found to be 7mm antero-posteriorly and 5mm vertically.[4] The amount of space inhabited by the mental and mandibular foramina, along with their unique morphologies, need to be taken into account for identification purposes on CBCT images. 3D landmark reliability studies demonstrate that landmarks plotted on CBCT require definitions based on all three dimensions (axial, coronal, and sagittal) for sufficient reliability in identification.[5,6] Classic 2D cephalometric landmark definitions demonstrated lower reproducibility when identified on 3D data.[6] Therefore, the mental and mandibular foramina landmarks were defined in all three planes of space (coronal, sagittal, and axial) for this study in order to aid in identification.

Baumrind and Frantz[7] studied the reliability of identification of various 2D cephalometric landmarks. They found that the distribution of errors in identification

for most landmarks is systemic as each landmark has its own "characteristic and usually non-circular envelope of error". Error in identifying the landmarks in this study can lead to faulty conclusions. Hence, this is a two-part study where the reliability of identification of the mental and mandibular foramina is first assessed before their spatial stability relative to each other is analyzed. Bjork's classic implant studies concluded that the mandibular canal is a stable structure that can be used for superimposition of longitudinal cephalometric tracings.[8-11] Since the mental and mandibular foramina are continuous with the mandibular canal which houses the inferior alveolar neurovascular bundle, these foramina would appear to be a logical place to begin.

MATERIALS AND METHODS

The Case Western Reserve University Institutional Review Board (IRB) approved this study. The sample was chosen from pre-existing data of 1,535 patients treated in the orthodontic clinic at Case Western Reserve University School of Dental Medicine between July 2006 and March 2013.

For a descriptive study using continuous variables, we calculated that the 95% confidence level with a confidence interval width of ±0.5mm, and standard deviation of 0.64mm would require a minimum of 25 subjects. The final sample size was 41 subjects. The inclusion criteria were as follows: 1) no known mandibular or craniofacial pathology; 2) age at T1 between 7-14 years for males and 7-13 years for females; 3) CBCT images taken before and after orthodontic treatment with a time interval of at least 3 years; and 4) absence of accessory mental foramina.

18 males and 23 females were selected and the time interval between T1 and T2 CBCT scans varied from 3.0 to 5.7 years with a mean interval of 3.7 years (Table I).

All CBCT scans were taken at the Craniofacial Imaging Center at Case Western Reserve University School of Dental Medicine (CB MercuRayTM, Hitachi Medical Systems America Co. – Twinsburg, OH), using the custom settings of 2 mA, 120 kVp, and a 12-inch field of view.[12,13] Image data for each patient consisted of 512 slices, with isometric voxels sized 0.3777 mm. Image resolution was 1024 x 1024 pixels and 12 bits per pixel (4096 greyscale). Patients were scanned in the sitting position with head in the natural head posture and teeth in maximum intercuspation.

Scanning was performed at the end of the exhalation period when the patient was not swallowing. The reconstructed DICOM images were transferred to Dolphin Imaging 3D (Dolphin Imaging & Management Solutions, Chatsworth, California) and head orientation was standardized using the method described by Wu et al.[14] Cranial base foramina were used to set the axial, coronal and sagittal planes for each T1 and T2 CBCT image in single voxel cross sectional slice views as follows:

1) In the coronal view, the axial plane was aligned with the center of the left and right optical foramina.

2) In the axial view, the coronal plane was aligned with the center of the left and right foramina ovale and then the axial plane was scrolled to the level of foramen cecum.

3) The sagittal plane was positioned to pass through foramen cecum. Lastly, in the sagittal view, the pitch of the head was adjusted so that the axial plane overlaps McRae's line (basion to opisthion).

After orientation, the coordinate system for the voxel dataset was saved. This allowed consistent and comparable XYZ coordinate values for all landmarks. Four anatomical structures, the right and left mental foramina and the right and left mandibular foramina were used. These landmarks were plotted, by a single observer, on single voxel cross sectional slices using Dolphin 3D in an XYZ Cartesian coordinate system based on the orientation described above.

The mandibular landmarks in this study were defined in all three planes of space as follows to ensure maximum reproducibility (see Table II for landmark

definitions). The steps for plotting each landmark in the CBCT slice views were as follows:

Mental Foramen (Figures 1-4):
1) *Sagittal View*: Identify mental foramen in area surrounding the lower second premolar. Intersect the coronal and axial planes in the middle of the foramen.
2) *Axial View*: Align the coronal plane with the long axis of the bony passage of the foramen. This entails a counterclockwise rotation of the image for the right foramen and a clockwise rotation for the left foramen.
3) *Coronal View*: Line up axial plane with long axis of bony passage of foramen. Intersect sagittal plane with axial plane in center of foramen.
4) *Sagittal View*: Intersect coronal and axial planes in center of foramen's circular opening and plot landmark at this intersection.
5) Confirm landmark position in axial, coronal, and sagittal views and that it meets definitional criteria for each plane.

Mandibular Foramen (Figures 5-10):
1) *Axial View*: Align sagittal plane with long axis of the ramus. Scroll coronal plane to anterior border of ramus. Then scroll sagittal plane medially until mandibular canal is visible in sagittal view.
2) *Sagittal View*: Align coronal plane with long axis of proximal segment of mandibular canal.
3) *Coronal View*: Align sagittal plane with long axis of Mandibular canal and scroll axial plane down to superior aspect of medial wall of foramen.
4) *Sagittal View*: Confirm that the axial plane crosses most constricted point of mandibular foramen in the sagittal view.
5) *Axial View*: Confirm coronal and axial planes cross in center of circular opening of foramen and plot landmark there.
6) Confirm landmark position in axial, coronal, and sagittal views and that it meets definitional criteria for each plane.

A single operator plotted the four landmarks for each subject's T1 and T2 CBCT images three times at intervals of at least three weeks. The XYZ coordinates for each landmark were exported into Microsoft Excel (Microsoft Corporation, Redmond, WA) where descriptive statistics along with distance and angle measurements were calculated. The previously saved default head orientation was restored prior to exporting coordinate data to ensure consistency.

Because landmarks were plotted three times for each of the 41 subjects, each landmark has 123 independently located estimates for both T1 and T2. This totals 246 independent estimates for the location of each of the four landmarks.

Each subject's three data sets of X, Y, and Z coordinate values were averaged for each landmark (for both time points). The subjects' landmark coordinate standard deviations for X, Y, and Z components (Tables III-IV) were calculated and compared for T1 and T2 samples using paired t-tests (Table V).

Each landmark's envelope of error in identification was estimated by adapting the method published by Baumrind and Frantz[7] for 2D landmarks to incorporate the 3rd dimension. The measures of dispersion and mean estimating errors were calculated for each landmark's X, Y, and Z vector components (Table VI). The distribution of error for each landmark is also graphically displayed using three- and two-dimensional scatterplots (Figures 11-14) illustrating the individual coordinate data point deviations from the mean.

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc, Chicago, IL) software and distribution of error scatterplots were constructed using John's Macintosh Program (JMP 10, SAS Institute Inc., Cary, NC).

Due to the fact that head orientation is based upon the cranial base, mandibular landmark coordinate values at two time points cannot be directly compared. Downward and forward displacement of the mandible during growth as well as possible clockwise or counterclockwise rotation at the temporomandibular joint makes direct comparison of T1 and T2 landmark coordinate values invalid. However,

the relative distances between the landmarks can be directly compared between T1 and T2 using Euclidean geometric principles. Each landmark's averaged coordinate values were used to calculate the distance measurements between landmarks for all subjects at T1 and T2. The distance between two points is the shortest length of the path connecting them, which is a straight line. In a three dimensional plane, the distance between points (X_1, Y_1, Z_1) and (X_2, Y_2, Z_2) is given by:

Distance $= \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2 + (Z_2 - Z_1)^2}$

Distances between all paired combinations of landmarks were calculated using the formula above (see Figure 15).

Angles a-d were calculated using the trigonometric principle of the Law of Cosines. The Law of Cosines relates the lengths of the sides of a plane triangle to the cosine of one of its angles. It can be used to solve for the angles of a triangle if all three sides are known. Given a triangle with known lengths a, b, and c (see Figure 16), the Law of Cosines states that the angle opposite the longest side can be found as follows:

$\gamma = \cos^{-1}(a^2 + b^2 - c^2/2ab)$

Therefore, angles a-d were derived using the calculated distances in the previous step. To ensure accuracy, calculated angle measurements were confirmed to sum to 360 degrees as all interior angles in a quadrilateral should. All derived angles were converted from radians to degrees. The T2 and T1 calculated distances and angles were compared to assess changes (Tables VII-IX).

It was assumed that mandibular growth between T1 and T2 would affect the X-axis (transverse) the least and therefore the changes in their X-coordinate values would be smaller than Z or Y. In addition to calculating three dimensional distance changes, the T2-T1 changes between the mental foramina on the transverse axis were calculated as follows: ($|RMefX_{T2}|+|LMefX_{T2}|$) - ($|RMefX_{T1}|+|LMefX_{T1}|$). The same concept was applied to the distance change between the mandibular foramina, which was calculated as follows: ($|RMfX_{T2}|+|LMfX_{T2}|$) - ($|RMfX_{T1}|+|LMfX_{T1}|$). These T2-T1 distance change calculations were compared to the changes calculated using the three-dimensional distance formula (Tables X-XI).

RESULTS

The T1 and T2 standard deviations for each landmark are listed by subject in Tables III-IV. Twelve paired t-tests were run to test the null hypotheses that the standard deviations between T1 and T2 were equal across landmarks' X, Y, and Z dimensions. There were no statistically significant ($p<.05$) differences in standard deviations between T1 and T2 for any of the landmarks and all null hypotheses were accepted (Table V). Therefore, T1 and T2 data were pooled for each landmark to assess reliability.

Figures 12-15 display each landmark's distribution of error following the method adapted from Baumrind and Frantz[7]. Each subject's T1 and T2 images had three estimates for all four landmarks. Pooling of T1 and T2 data yielded 246 estimates for each landmark (41 subjects x 2 CBCT images x 3 estimates = 246 estimates per landmark). This resulted in a 246-point scatterplot displaying the distribution of error for each landmark in all three dimensions. Each point represents the individual estimate's deviation from the mean for that subject. The individual subject deviations for the right and left mental foramina ranged from 0.00mm to 0.60mm in absolute value. The absolute value of individual deviations ranged from 0.00mm to 0.87mm for the right and left mandibular foramina.

Descriptive statistics for the measures of dispersion and mean estimating errors have all been calculated in line with Baumrind and Frantz[8] and are listed in Table 4. Standard deviations for the error distribution of each landmark (Table VI, Columns 1-3) have been calculated for all three dimensions as follows:

$$S.D = \sqrt{\frac{\sum d^2}{N(K-1)}}$$

Where:

d = individual landmark deviation from mean value
N = no. of CBCT images = 41 subjects x 2 CBCT images (T1 & T2) per subject = 82
K = no. of times data was collected = 3

To determine each landmark's mean magnitude of error (mean estimating error), the mean of the absolute values of all 246 deviations was calculated for each landmark (Table VI, Columns 4-6). The value for standard error of the mean was calculated as:

$$S.E.M = \frac{S.D}{\sqrt{N}}$$

Table VI lists the range of error ± 2(S.E.M) in each dimension for each landmark. At the 95% confidence level, the average error of each landmark lies within this interval. The precision of the estimated range of error was improved by increasing the sample size from the minimum requirement of 25 subjects to the 41 subjects used in this study. A larger sample size results in a tighter confidence interval with a more precise and smaller margin of error.

The distribution of error scatterplots (Figures 12-15), measures of dispersion (Table VI, Columns 1-3), and mean estimating errors (Table VI, Columns 4-6) demonstrate that the variation of the estimates for the location of the mental foramina was greater along the horizontal and vertical axes when compared to the anterior-posterior axis. Variations in the estimates of the location of the mandibular foramina

were greater along the vertical axis compared to either the horizontal or anterior-posterior axis.

Calculated distances and angles for T1 and T2 are listed in Tables VII-VIII. These distances were compared to direct measurements in dry mandibles and found to be in similar ranges. The T2-T1 changes in distances and angles are listed in Table IX. Distances were found to change between all paired combinations of landmarks. Distances between the right and left mental foramina changed the least, being less than 1mm for 70% of the subjects. Negative values for this distance change are within bounds of that subject's measures of dispersion in landmark identification, and are interpreted as no distance change. The distance between the right and left mandibular foramina increased for all subjects.

Distances between the mental and mandibular foramina increased for all but three subjects. Looking at Table IX, one can see that all distance changes for these three subjects ranged between -0.05mm to -0.33mm. These negative values are once more within bounds of these subjects' measures of dispersion and are interpreted as no distance change. Distance increases between the mental and mandibular foramina on right and left sides were often of similar magnitude, but in some cases notably different. The results of the two calculation methods of T2-T1 distance change for RMef-LMef and RMf-LMf were found to match closely (see Tables X-XI).

Angles were found to change minimally, except in instances where one side of the mandible showed a sizable asymmetric change in distance between the mental and mandibular foramina when compared to the opposite side.

DISCUSSION

The purpose of this study was to evaluate the mental and mandibular foramina's use as natural reference structures for mandibular regional superimposition of longitudinal 3D images.

Both the mental and mandibular foramina displayed non-circular envelopes of error. The envelope of error mirrored the shape of the foramen. The mental foramina were most easily identified in the anterior posterior plane. It is most clearly defined in this dimension because it inhabits the least amount of space along this axis. The variation of the estimates was primarily distributed along the horizontal and vertical axes in line with its anatomical shape. The distribution of error for the mandibular foramina was greatest along the vertical axis. This is consistent with findings by Baumrind who reported that the sharpness of the viewed edge – the degree to which the edge contrasts with the surrounding area plays an influence in the magnitude of identification error.[7] The variation of estimates for the mandibular foramen were greater along the vertical axis primarily because the landmark definition in the coronal plane relies on the visibility of the most superior aspect of the foramen's medial wall. There is variation among subjects in the density and thickness of this wall. Several subjects displayed mandibular foramina with thin medial walls whose superiormost aspect was sometimes difficult to distinguish on CBCT images. Nonetheless, the average of identification error for each landmark in this study was ≤0.50mm in all dimensions (Table VI) and thus not of clinical significance.

Relative stability of the landmarks within the mandible was assessed by comparing all paired landmark distances between T1 and T2 images. The mental foramina changed the least in position, displaying slight remodeling activity in a lateral direction. The mandibular foramina were found not to be stable landmarks during growth as they appear to be remodeling posteriorly and the distance between them also increasing in the transverse dimension. The fact that both the mental and mandibular foramina seem to be remodeling laterally brings into question the stability of the mandibular canal. The bone surrounding the inferior alveolar nerve is cancellous which has a structure as in a sponge, making it light but strong.[15] The porous nature of the internal structure of the mandible may allow for lateral remodeling of the mandibular canal. Further studies are needed to determine the stability of the mandibular canal in the transverse dimension.

Ricketts[16] introduced the "Corpus axis", a plane connecting the protuberance menti (Pm) to Xi point, and compared it to the occlusal plane to differentiate dental from skeletal changes. Xi point "proved to be a strong biologic point which represents the mandibular foramen.[16] Distances between ipsilateral mental and mandibular foramina may similarly be taken to represent the right and left halves of the mandibular corpus. If taken as such, the results of this study demonstrate that the right and left sides of the mandibular corpus do not necessarily grow equal amounts. The methods used in this study, of measuring distances between the ipsilateral mental and mandibular foramina, may be particularly useful to identify mandibular skeletal components of subdivision malocclusions. These distances can either be analyzed at a

single timepoint to evaluate an existing mandibular asymmetry or the distance changes between timepoints can be analyzed to assess if asymmetric mandibular growth has occurred. For example, subjects with significant differences between their RMef-RMf and LMef-LMf distances often displayed different canine and molar relationships on their right and left sides, which were consistent with the lengths of these distances. In addition, mandibular deviations and lower midlines of various subjects were consistent with the calculated distances reflecting one side of the mandible being longer than the opposite side. One subject in the study exhibited relatively symmetric right and left halves of the mandibular corpus at T1. Significant asymmetric growth of the mandible (based off of RMef-RMf and LMef-LMF distance changes) occurred between T1 and T2 and the final right and left molar occlusion reflected this. This patient also displayed a mandibular deviation and off centered lower midline consistent with the calculated distances.

Longitudinal analysis on overall mandibular shape has not been analyzed to date. Minimal changes in angles between the landmarks, in this study, reveal that the mandible relatively maintains its shape over time. These results are in line with Enlow's V-principle of growth.[17] Angular changes between the landmarks occurred only with asymmetric mandibular growth.

The right and left mental foramina may possibly be used as natural reference structures for 3D mandibular regional superimposition due to the fact that they change the least in position during growth and because they are reliably identified on CBCT images. A proposed method of regional superimposition is to register the right

and left mental foramina along with alignment of the mandibular canal in the sagittal view due to the possibility of the canal remodeling laterally. Further studies are needed to test this proposed method.

CONCLUSION

The results from this study in conjunction with existing knowledge regarding mandibular growth lead us to conclude the following: 1) The mental foramina change the least in position relative to each other, displaying slight remodeling activity in a lateral direction. 2) The mandibular foramina are not stable landmarks during growth as they appear to remodel posteriorly with the distance between them increasing. 3) The mental foramina can be reliably identified on CBCT images and may possibly be used as anterior-posterior registration points for three-dimensional mandibular regional superimposition.

Mental Foramen - Method of Identification

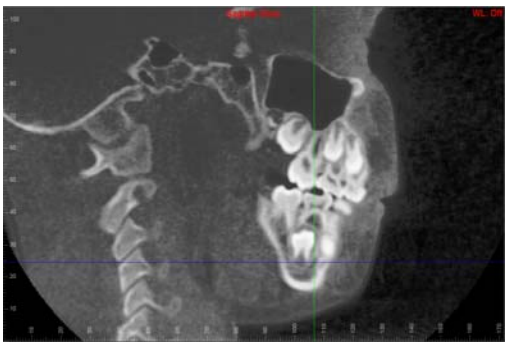


Figure 1 - Sagittal View: Identify mental foramen in area surrounding the lower second premolar. Intersect the coronal and axial planes in the middle of the foramen.

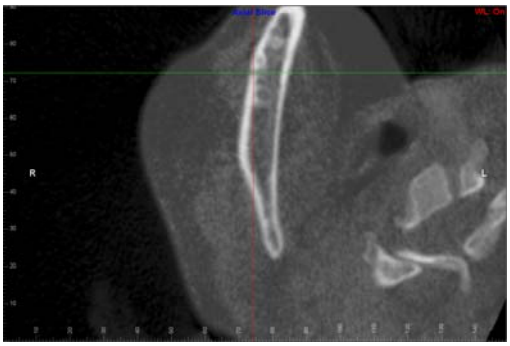


Figure 2 - Axial View: Align the coronal plane with the long axis of the bony passage of the foramen. This entails a counterclockwise rotation of the image for the right foramen and a clockwise rotation for the left foramen.

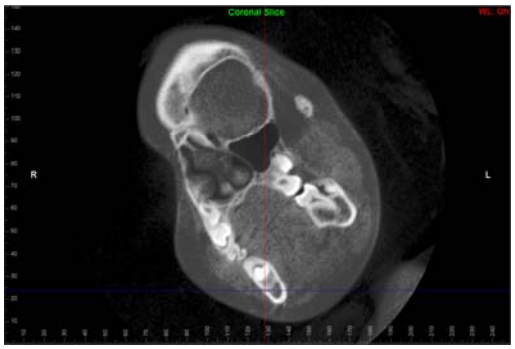


Figure 3 - Coronal View: Line up axial plane with long axis of bony passage of foramen. Intersect sagittal plane with axial plane in center of foramen.

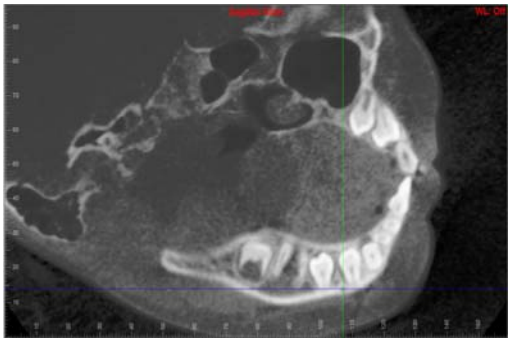


Figure 4 - Sagittal View: Intersect coronal and axial planes in center of foramen's circular opening and plot landmark at this intersection.

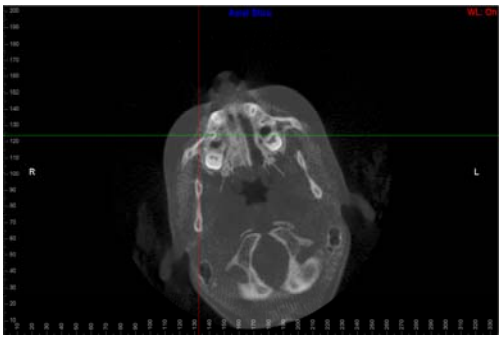


Figure 5 - Axial View: Align sagittal plane with long axis of the ramus.

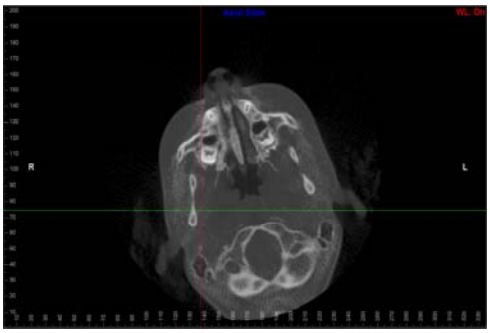


Figure 6 - Axial View: Scroll coronal plane to anterior border of ramus. Then scroll sagittal plane medially until mandibular canal is visible in sagittal view.

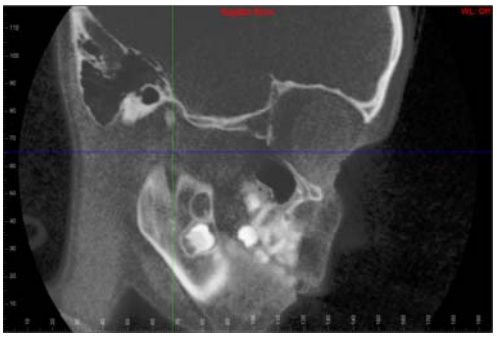


Figure 7 - Sagittal View: Align coronal plane with long axis of proximal segment of mandibular canal.

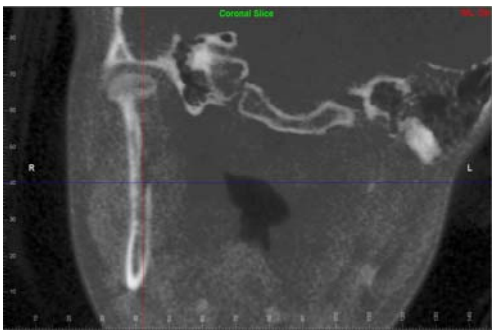


Figure 8 - Coronal View: Align sagittal plane with long axis of Mandibular canal and scroll axial plane down to superior aspect of medial wall of foramen.

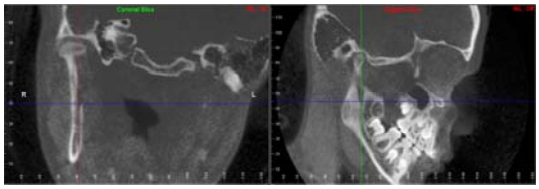


Figure 9 - Sagittal View: Confirm that the axial plane crosses most constricted point of mandibular foramen in the sagittal view.

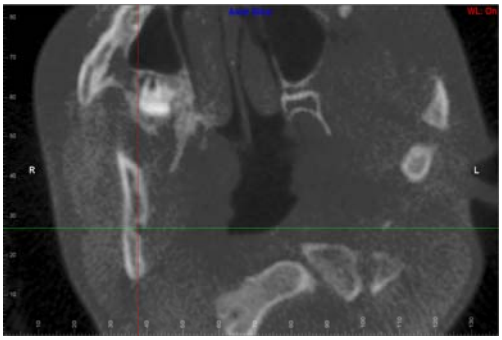


Figure 10 - Axial View: Confirm coronal and axial planes cross in center of circular opening of foramen and plot landmark there.

Distribution of Error Scatterplots
(X= Transverse, Y= Vertical, Z= AP)

Right Mental Foramen

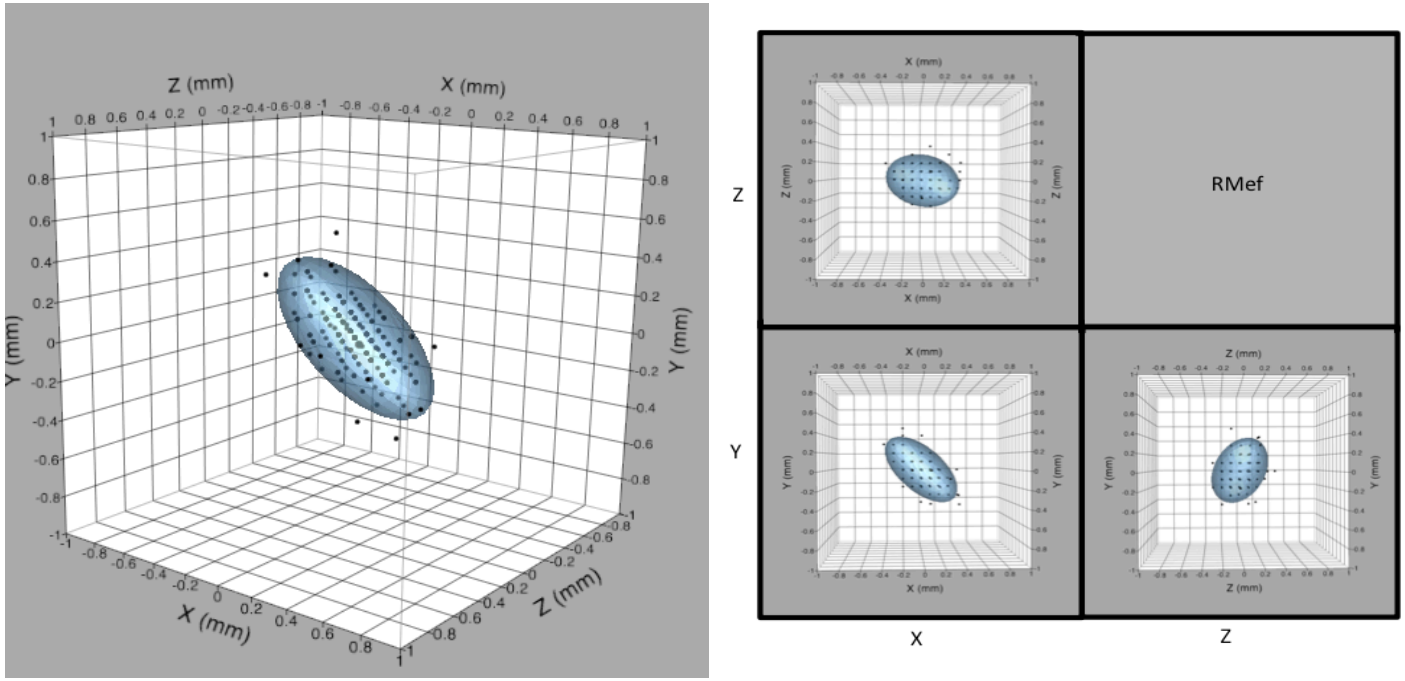


Figure 11 - Deviations of estimates for right mental foramen in the X, Y, and Z directions.

Contour ellipses encompass 95% of points.

Distribution of Error Scatterplots
(X= Transverse, Y= Vertical, Z= AP)

Left Mental Foramen

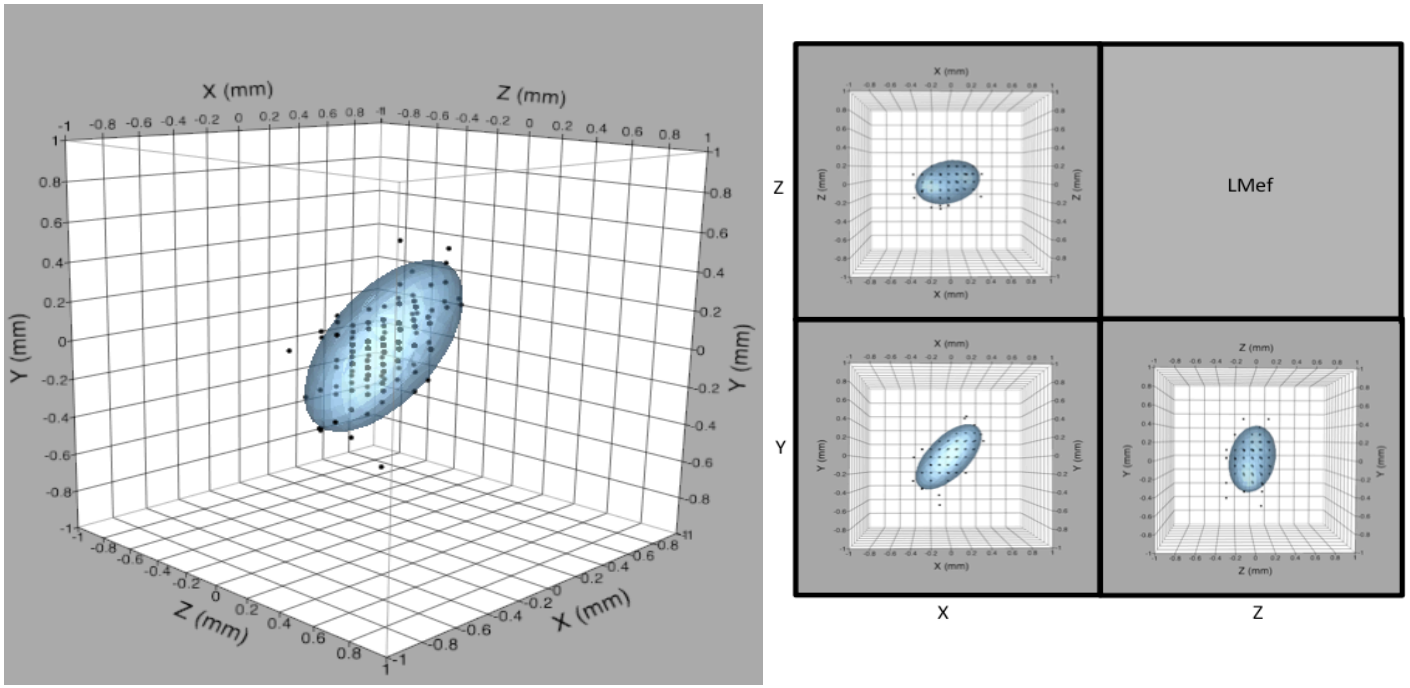


Figure 12 - Deviations of estimates for left mental foramen in the X, Y, and Z directions.

Contour ellipses encompass 95% of points.

Distribution of Error Scatterplots
(X= Transverse, Y= Vertical, Z= AP)

Right Mandibular Foramen

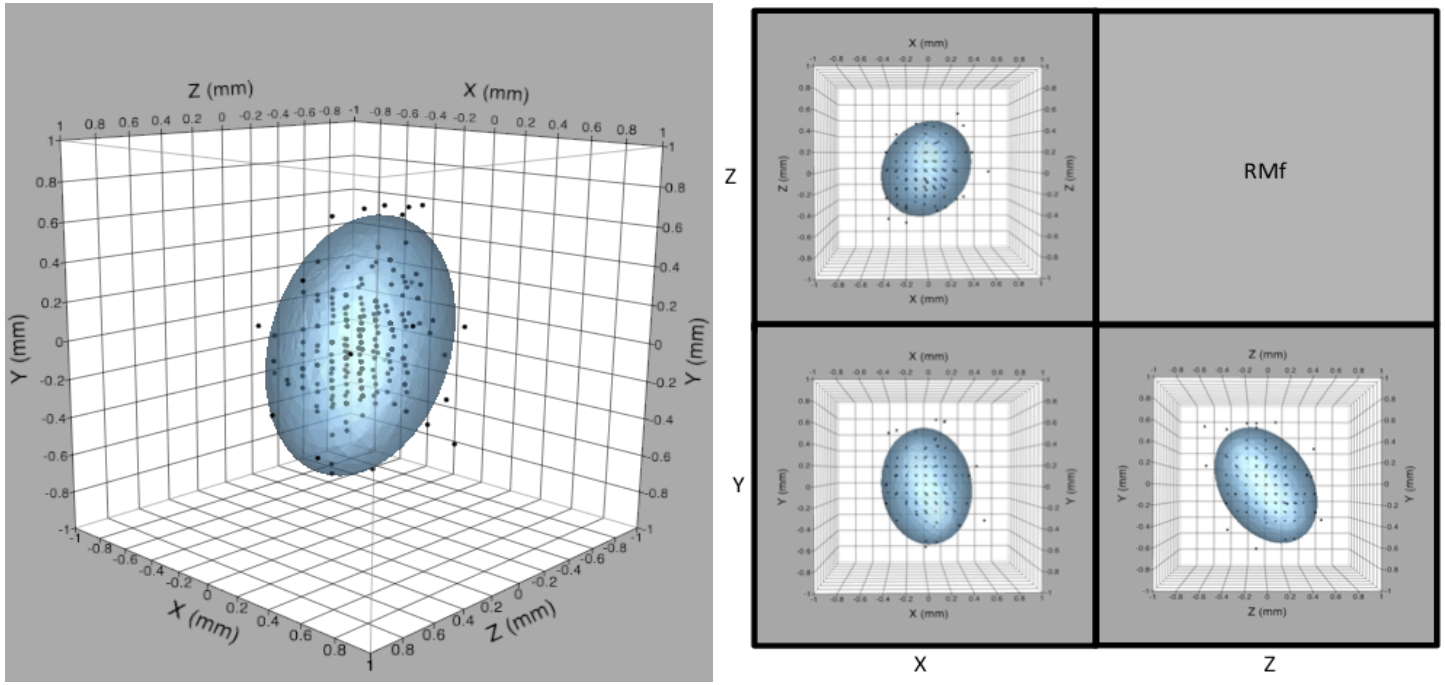


Figure 13 - Deviations of estimates for right mandibular foramen in the X, Y, and Z directions.

Contour ellipses encompass 95% of points.

Distribution of Error Scatterplots
(X= Transverse, Y= Vertical, Z= AP)

Left Mandibular Foramen

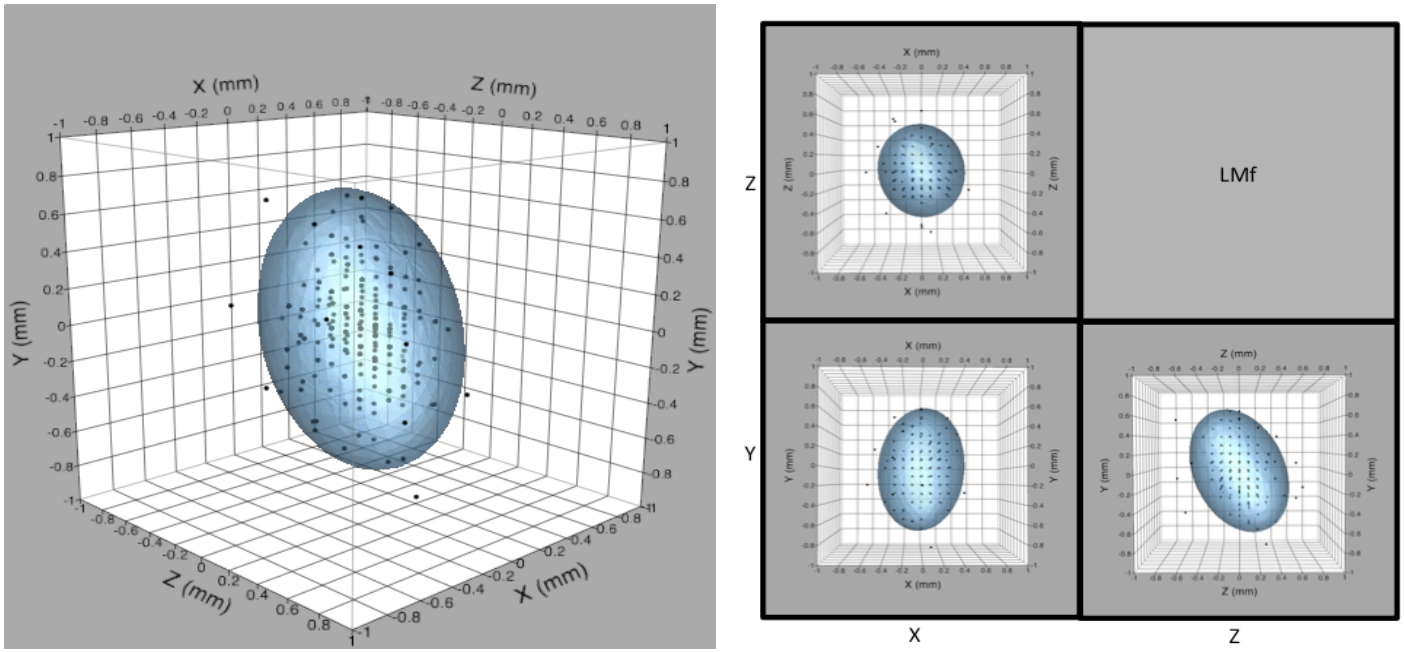
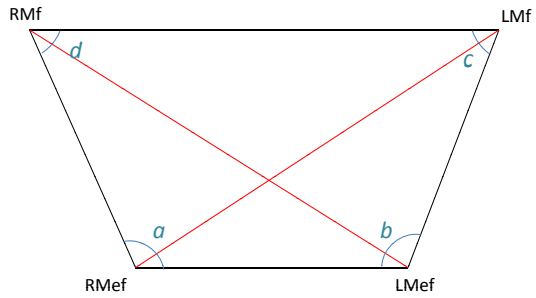


Figure 14 - Deviations of estimates for left mandibular foramen in the X, Y, and Z directions.

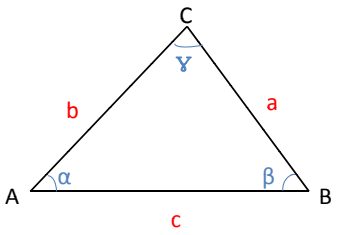
Contour ellipses encompass 95% of points.

Figure 15 - Distance and Angle Diagram



Key	
RMef	Right Mental Foramen
LMef	Left Mental Foramen
RMf	Right Mandibular Foramen
LMf	Left Mandibular Foramen

Figure 16 - Law of Cosines



$$\gamma = \cos^{-1}(a^2 + b^2 - c^2 / 2ab)$$

Table I - Sample

Sample			
Age at T1	**Females**	**Males**	**Total**
Age 7-9	6	1	7
Age 10-11	8	11	19
Age 12-13	9	3	12
Age 14	0	3	3
Total	**23**	**18**	**41**

Table II - Landmark Definitions

Landmark	Anatomical Definition	Axial Plane Definition	Coronal Plane Definition	Sagittal Plane Definition
Mental Foramen	Opening on lateral part of body of the mandible, inferior to the 2nd premolar.	Mid-point of opening in cortical outline of external surface of mandible	Mid-point of superior-inferior height of opening in cortical outline of lateral border of mandible	Center of foramen in vicinity of mandibular 2nd premolar.
Mandibular Foramen	Opening on medial aspect of the vertical ramus of the mandible between the mandibular and gonial notches.	Center of circular foramen opening.	Midpoint between medial and lateral walls of foramen vertically in line with superiormost point of medial wall of foramen.	Point of greatest constriction of funnel like opening of foramen.

Table III - T1 Standard Deviations

	T1											
	RMef			LMef			RMf			LMf		
ID	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
GR149	0.06	0.06	0.00	0.06	0.10	0.21	0.32	0.06	0.06	0.10	0.15	0.15
RO217	0.10	0.12	0.12	0.06	0.21	0.15	0.06	0.21	0.06	0.15	0.17	0.20
GR191	0.17	0.20	0.10	0.10	0.15	0.06	0.12	0.06	0.17	0.06	0.36	0.20
AL96	0.21	0.06	0.23	0.15	0.50	0.26	0.10	0.55	0.38	0.06	0.49	0.15
OE1	0.17	0.06	0.12	0.12	0.06	0.06	0.06	0.32	0.20	0.12	0.36	0.20
MA306	0.21	0.15	0.06	0.12	0.15	0.15	0.23	0.12	0.12	0.06	0.10	0.17
SU73	0.12	0.12	0.10	0.12	0.06	0.06	0.06	0.21	0.25	0.31	0.12	0.26
MA296	0.12	0.17	0.10	0.10	0.06	0.06	0.10	0.15	0.10	0.12	0.15	0.10
KE79	0.17	0.10	0.15	0.00	0.00	0.12	0.17	0.12	0.06	0.15	0.06	0.21
DA166	0.26	0.15	0.15	0.15	0.21	0.00	0.06	0.38	0.17	0.06	0.81	0.25
NA42	0.10	0.06	0.10	0.23	0.21	0.10	0.20	0.26	0.12	0.06	0.32	0.32
LI82	0.15	0.10	0.12	0.12	0.06	0.12	0.15	0.25	0.25	0.29	0.49	0.15
VI32	0.12	0.15	0.06	0.21	0.06	0.06	0.06	0.26	0.12	0.23	0.15	0.21
HA403	0.15	0.00	0.21	0.12	0.06	0.15	0.32	0.30	0.15	0.12	0.12	0.30
FE52	0.21	0.06	0.10	0.10	0.10	0.10	0.21	0.20	0.38	0.30	0.57	0.23
KI7	0.10	0.15	0.06	0.00	0.00	0.10	0.21	0.21	0.17	0.15	0.26	0.06
BA233	0.26	0.15	0.06	0.23	0.21	0.10	0.26	0.21	0.20	0.35	0.25	0.06
HA292	0.26	0.17	0.06	0.20	0.21	0.06	0.31	0.26	0.25	0.21	0.15	0.12
ZI27	0.06	0.10	0.35	0.21	0.20	0.21	0.15	0.17	0.31	0.20	0.26	0.26
TO85	0.21	0.21	0.15	0.25	0.17	0.21	0.35	0.21	0.00	0.10	0.15	0.10
KO123	0.23	0.21	0.23	0.15	0.15	0.15	0.10	0.29	0.42	0.55	0.38	0.15
HA424	0.15	0.20	0.21	0.12	0.10	0.15	0.20	0.38	0.25	0.06	0.38	0.20
KE88	0.10	0.10	0.06	0.06	0.10	0.12	0.21	0.15	0.15	0.06	0.36	0.10
BR247	0.10	0.10	0.15	0.06	0.00	0.10	0.00	0.20	0.06	0.21	0.12	0.15
SU74	0.12	0.12	0.12	0.15	0.29	0.12	0.12	0.26	0.06	0.20	0.26	0.26
WA168	0.20	0.15	0.06	0.15	0.10	0.15	0.10	0.35	0.21	0.12	0.35	0.06
BH2	0.32	0.36	0.26	0.35	0.25	0.15	0.35	0.51	0.60	0.35	0.26	0.40
LA130	0.20	0.15	0.10	0.23	0.32	0.10	0.25	0.17	0.10	0.20	0.55	0.15
JA111	0.12	0.15	0.20	0.20	0.30	0.23	0.15	0.20	0.17	0.10	0.23	0.21
RO193	0.06	0.00	0.12	0.23	0.12	0.06	0.15	0.25	0.21	0.30	0.26	0.23
MO208	0.36	0.31	0.15	0.26	0.32	0.12	0.26	0.59	0.15	0.31	0.25	0.49
MY13	0.31	0.10	0.10	0.12	0.10	0.10	0.17	0.46	0.46	0.12	0.46	0.15
TI29	0.10	0.15	0.12	0.17	0.15	0.06	0.15	0.17	0.17	0.23	0.30	0.21
WA179	0.21	0.15	0.20	0.12	0.10	0.12	0.12	0.12	0.29	0.15	0.15	0.12
PE120	0.06	0.15	0.10	0.06	0.06	0.00	0.20	0.66	0.17	0.15	0.62	0.17
WI297	0.12	0.29	0.12	0.15	0.23	0.06	0.12	0.23	0.21	0.12	0.36	0.21
BR293	0.06	0.15	0.06	0.06	0.06	0.06	0.06	0.10	0.23	0.06	0.15	0.15
VA90	0.06	0.17	0.15	0.15	0.15	0.10	0.23	0.12	0.15	0.17	0.17	0.26
PO105	0.12	0.17	0.10	0.15	0.06	0.00	0.10	0.10	0.06	0.15	0.10	0.15
NA57	0.10	0.12	0.12	0.15	0.06	0.10	0.12	0.47	0.25	0.15	0.50	0.53
GR186	0.12	0.10	0.21	0.06	0.15	0.25	0.06	0.12	0.44	0.06	0.52	0.62

Table IV - T2 Standard Deviations

	T2											
	RMef			LMef			RMf			LMf		
ID	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
GR149	0.21	0.12	0.06	0.12	0.12	0.06	0.31	0.23	0.35	0.12	0.31	0.25
RO217	0.06	0.15	0.06	0.15	0.12	0.15	0.15	0.12	0.17	0.15	0.06	0.10
GR191	0.29	0.15	0.15	0.12	0.15	0.10	0.06	0.31	0.15	0.15	0.21	0.21
AL96	0.06	0.17	0.17	0.17	0.15	0.10	0.10	0.12	0.10	0.29	0.40	0.12
OE1	0.06	0.12	0.06	0.06	0.06	0.06	0.15	0.15	0.10	0.12	0.26	0.25
MA306	0.25	0.20	0.06	0.15	0.15	0.00	0.10	0.31	0.12	0.17	0.10	0.06
SU73	0.15	0.12	0.12	0.12	0.06	0.25	0.21	0.25	0.17	0.36	0.45	0.06
MA296	0.06	0.06	0.06	0.15	0.17	0.12	0.06	0.23	0.15	0.15	0.15	0.12
KE79	0.06	0.17	0.12	0.12	0.06	0.06	0.12	0.12	0.10	0.06	0.10	0.00
DA166	0.00	0.06	0.06	0.06	0.15	0.06	0.23	0.25	0.06	0.10	0.15	0.06
NA42	0.00	0.06	0.15	0.10	0.06	0.12	0.06	0.15	0.12	0.12	0.06	0.10
LI82	0.20	0.15	0.21	0.23	0.10	0.06	0.29	0.23	0.20	0.25	0.15	0.12
VI32	0.26	0.17	0.17	0.25	0.15	0.12	0.15	0.10	0.17	0.23	0.12	0.10
HA403	0.10	0.06	0.15	0.06	0.06	0.10	0.49	0.51	0.06	0.21	0.40	0.12
FE52	0.06	0.35	0.17	0.06	0.06	0.00	0.15	0.20	0.10	0.46	0.15	0.25
KI7	0.10	0.00	0.10	0.25	0.12	0.15	0.06	0.26	0.31	0.26	0.21	0.35
BA233	0.29	0.06	0.25	0.21	0.10	0.10	0.25	0.23	0.06	0.15	0.12	0.10
HA292	0.00	0.06	0.21	0.26	0.38	0.23	0.26	0.26	0.35	0.21	0.31	0.21
ZI27	0.12	0.32	0.15	0.06	0.10	0.10	0.15	0.26	0.15	0.17	0.31	0.17
TO85	0.25	0.15	0.10	0.32	0.25	0.06	0.06	0.35	0.26	0.21	0.15	0.29
KO123	0.17	0.15	0.12	0.10	0.15	0.12	0.10	0.70	0.10	0.23	0.60	0.32
HA424	0.35	0.30	0.06	0.10	0.12	0.10	0.10	0.10	0.10	0.29	0.32	0.25
KE88	0.06	0.10	0.10	0.06	0.10	0.00	0.17	0.10	0.06	0.15	0.26	0.20
BR247	0.15	0.10	0.10	0.10	0.00	0.06	0.15	0.00	0.06	0.17	0.15	0.12
SU74	0.21	0.26	0.06	0.25	0.17	0.00	0.06	0.29	0.35	0.12	0.21	0.38
WA168	0.10	0.06	0.17	0.25	0.26	0.10	0.36	0.12	0.30	0.20	0.26	0.10
BH2	0.21	0.17	0.10	0.12	0.17	0.06	0.00	0.40	0.12	0.23	0.12	0.65
LA130	0.12	0.06	0.06	0.32	0.29	0.10	0.10	0.21	0.06	0.32	0.40	0.10
JA111	0.15	0.47	0.10	0.17	0.56	0.12	0.38	0.32	0.21	0.00	0.12	0.38
RO193	0.12	0.06	0.06	0.31	0.36	0.10	0.21	0.15	0.32	0.31	0.29	0.20
MO208	0.35	0.31	0.06	0.06	0.23	0.06	0.35	0.21	0.21	0.25	0.47	0.35
MY13	0.25	0.31	0.06	0.10	0.10	0.06	0.32	0.21	0.56	0.12	0.46	0.06
TI29	0.10	0.32	0.15	0.15	0.15	0.15	0.17	0.15	0.17	0.06	0.10	0.06
WA179	0.20	0.06	0.00	0.32	0.06	0.17	0.20	0.15	0.15	0.15	0.12	0.06
PE120	0.06	0.20	0.10	0.15	0.06	0.10	0.17	0.56	0.35	0.25	0.66	0.20
WI297	0.32	0.10	0.12	0.12	0.20	0.10	0.12	0.21	0.06	0.26	0.06	0.29
BR293	0.10	0.15	0.06	0.06	0.06	0.06	0.12	0.06	0.10	0.15	0.21	0.20
VA90	0.12	0.17	0.06	0.00	0.06	0.06	0.21	0.20	0.32	0.32	0.35	0.06
PO105	0.06	0.06	0.06	0.10	0.12	0.06	0.12	0.00	0.15	0.25	0.25	0.06
NA57	0.06	0.06	0.00	0.12	0.12	0.06	0.45	0.21	0.25	0.10	0.40	0.06
GR186	0.00	0.06	0.17	0.10	0.20	0.06	0.10	0.06	0.40	0.25	0.17	0.58

Table V - T1 and T2 Comparison of Standard Deviations by Paired T-Tests

T1 & T2 SD Comparison by Paired T-Test (α=0.05)	
Pair	**Sig. (2-tailed)**
RMefT1X - RMefT2X	0.42
RMefT1Y - RMefT2Y	0.54
RMefT1Z - RMefT2Z	0.12
LMefT1X - LMefT2X	0.48
LMefT1Y - LMefT2Y	0.83
LMefT1Z - LMefT2Z	0.12
RMfT1X - RMfT2X	0.46
RMfT1Y - RMfT2Y	0.22
RMfT1Z - RMfT2Z	0.52
LMfT1X - LMfT2X	0.12
LMfT1Y - LMfT2Y	0.09
LMfT1Z - LMfT2Z	0.28

Table VI - Overall T1 + T2 Measures of Dispersion and Mean Estimating Errors

	Measures of Dispersion (mm)			Mean Estmating Error (mm)		
Landmark	**SD_X**	**SD_Y**	**SD_Z**	**X**	**Y**	**Z**
RMef	0.17	0.17	0.13	0.11±0.04	0.11±0.04	0.09±0.03
LMef	0.16	0.18	0.12	0.11±0.04	0.11±0.04	0.07±0.03
RMf	0.20	0.28	0.23	0.13±0.04	0.18±0.06	0.14±0.05
LMf	0.21	0.32	0.24	0.14±0.05	0.20±0.07	0.15±0.05

X = Horizontal Y = Vertical Z = Anterior-Posterior

Table VII - T1 Distances and Angles

				T1									
				Distances						Angles			
ID	Sex	Age (YRS)	T2-T1 Interval (YRS)	RMef to LMef	RMf to LMf	RMf to RMef	LMf to LMef	RMf to LMef	LMf to RMef	a	b	c	d
GR149	F	7.83	3.75	42.38	80.92	48.38	48.58	76.23	75.77	114.09	112.62	66.81	66.30
RO217	F	8.17	3.33	41.36	72.64	47.53	47.12	73.42	71.39	111.18	107.42	72.08	69.32
GR191	F	8.50	4.92	38.40	68.52	49.84	49.76	71.30	71.65	107.08	108.05	72.17	72.58
AL96	F	8.83	3.50	42.61	76.96	54.44	56.16	77.86	81.32	106.04	110.08	69.59	74.25
OE1	F	8.92	4.08	40.67	76.42	57.48	53.84	78.55	78.89	105.02	112.42	71.81	70.58
MA306	F	9.33	4.08	41.23	75.83	51.10	51.35	75.55	76.10	109.35	110.10	69.88	70.63
SU73	F	10.08	3.58	40.80	73.96	51.03	51.19	74.22	75.80	107.32	110.46	70.06	72.03
MA296	F	10.17	4.92	41.41	77.42	49.10	49.81	74.60	75.74	110.75	111.94	67.84	69.45
KE79	F	11.17	5.67	41.81	75.22	53.02	53.92	76.61	78.33	107.17	109.16	70.58	72.99
DA166	F	11.33	3.67	43.27	77.33	58.11	58.88	82.37	82.13	107.77	106.03	73.00	73.11
NA42	F	11.67	3.58	42.74	75.79	52.84	51.48	77.54	76.82	107.98	108.87	72.24	70.79
LI82	F	11.83	3.17	42.48	75.44	50.02	53.00	76.24	76.79	110.77	106.57	70.36	72.28
VI32	F	11.83	3.42	37.34	76.21	58.29	57.58	78.90	78.61	109.21	109.99	70.71	70.09
HA403	F	12.00	3.42	49.32	78.17	58.69	60.07	86.98	84.81	106.96	101.22	76.74	75.08
FE52	F	12.58	3.50	44.95	76.95	56.29	54.93	81.66	80.22	106.99	106.43	74.42	72.15
KI7	F	12.58	3.58	43.46	80.73	53.92	55.43	79.48	81.72	108.92	110.86	68.55	71.61
BA233	F	12.67	3.08	41.58	78.83	58.55	57.82	82.14	81.09	109.06	108.22	72.04	70.60
HA292	F	13.00	3.00	46.98	76.82	61.94	65.51	86.69	88.42	104.64	102.38	74.58	78.37
ZI27	F	13.00	3.25	40.82	78.81	50.52	51.17	76.10	76.24	112.42	111.45	67.87	68.25
TO85	F	13.33	3.17	38.94	79.23	55.61	58.64	79.32	79.89	112.86	108.21	68.38	70.18
KO123	F	13.42	3.17	39.62	74.68	56.25	59.04	78.75	79.75	109.21	106.19	71.07	73.53
HA424	F	13.58	3.42	39.73	79.14	56.55	58.75	79.59	81.23	110.28	109.64	68.68	71.35
KE88	M	7.75	4.92	38.59	74.42	51.58	49.61	73.86	73.52	109.13	112.31	69.85	68.66
BR247	M	10.33	4.50	42.90	77.24	52.01	53.06	76.66	79.19	107.35	110.77	69.25	72.62
SU74	M	10.92	3.50	40.31	75.04	54.21	54.59	76.20	78.49	106.52	110.71	69.98	72.78
WA168	M	10.92	3.42	39.82	82.35	54.33	55.74	78.16	80.67	111.29	114.13	65.69	68.87
BH2	M	11.17	3.50	45.42	82.10	60.50	60.51	84.69	87.22	105.27	110.02	71.02	73.67
LA130	M	11.33	3.25	45.37	83.23	58.27	58.97	85.82	83.97	111.21	106.46	71.97	70.29
JA111	M	11.42	4.17	42.74	86.28	53.82	55.63	80.89	82.56	113.31	113.50	65.40	67.70
RO193	M	11.42	3.42	39.85	80.08	55.11	57.39	78.58	80.84	110.66	111.20	67.41	70.72
MO208	M	11.50	3.50	43.16	83.26	66.50	67.37	89.74	89.96	107.93	106.90	72.26	72.86
MY13	M	11.83	3.50	44.64	76.11	52.26	49.93	77.60	77.38	106.15	109.69	72.66	71.41
TI29	M	11.83	3.25	40.80	79.25	55.36	57.78	80.32	80.07	112.40	107.36	69.76	70.46
WA179	M	11.83	3.33	46.07	81.36	55.42	54.46	82.41	82.11	108.22	109.24	71.62	70.92
PE120	M	11.92	4.33	42.57	77.60	53.93	54.12	79.39	78.35	110.15	107.65	71.62	70.52
WI297	M	12.67	3.42	41.48	77.92	59.23	57.64	80.51	82.45	104.78	111.54	71.08	72.46
BR293	M	13.33	3.58	42.03	85.22	56.37	60.18	82.39	84.65	112.88	110.57	66.46	70.08
VA90	M	13.33	3.42	37.30	77.10	52.11	53.20	74.01	76.27	110.64	113.71	66.30	69.28
PO105	M	14.08	3.50	41.99	80.95	59.98	57.18	84.32	80.96	110.30	108.47	72.96	68.26
NA57	M	14.17	3.83	40.64	72.91	51.72	52.89	74.17	76.77	106.23	109.64	70.20	73.85
GR186	M	14.67	3.50	41.44	82.91	65.26	65.01	89.42	85.78	111.93	105.23	73.26	69.59

Distances in mm, Angles in degrees

Table VIII - T2 Distances and Angles

				T2									
				Distances						Angles			
ID	Sex	Age (YRS)	T2-T1 Interval (YRS)	RMef to LMef	RMf to LMf	RMf to RMef	LMf to LMef	RMf to LMef	LMf to RMef	a	b	c	d
GR149	F	7.83	3.75	43.14	88.06	53.54	55.52	82.10	82.42	115.84	112.72	65.23	66.05
RO217	F	8.17	3.33	41.31	76.75	51.29	50.70	76.84	75.09	111.71	108.96	70.82	68.51
GR191	F	8.50	4.92	39.53	71.21	51.52	52.53	73.50	75.10	106.90	108.49	71.05	73.49
AL96	F	8.83	3.50	43.06	82.50	59.80	62.66	83.21	87.59	106.86	110.52	68.39	74.06
OE1	F	8.92	4.08	40.28	77.94	59.45	56.01	80.20	80.57	105.45	112.58	71.44	70.34
MA306	F	9.33	4.08	40.82	80.05	55.97	56.75	79.53	81.00	109.50	111.19	68.68	70.58
SU73	F	10.08	3.58	42.61	78.65	55.89	56.17	79.58	81.52	106.99	110.47	70.09	72.35
MA296	F	10.17	4.92	41.48	80.82	53.57	54.55	78.75	79.66	111.27	111.40	67.98	69.34
KE79	F	11.17	5.67	42.96	78.63	56.68	58.03	80.49	82.74	106.98	109.11	70.33	73.38
DA166	F	11.33	3.67	43.58	80.41	60.10	61.95	85.12	84.83	109.35	105.67	72.13	72.66
NA42	F	11.67	3.58	44.04	77.71	55.17	52.59	80.57	78.42	108.09	108.17	73.56	70.00
LI82	F	11.83	3.17	42.35	77.27	51.44	53.88	77.80	77.67	111.73	107.03	70.20	71.04
VI32	F	11.83	3.42	38.04	77.43	58.82	57.26	80.15	78.77	109.82	109.84	71.25	69.09
HA403	F	12.00	3.42	50.28	81.35	61.98	64.80	90.72	89.32	107.37	101.07	75.79	75.75
FE52	F	12.58	3.50	45.57	78.89	58.48	58.57	83.51	84.05	106.09	106.96	73.14	73.76
KI7	F	12.58	3.58	44.20	84.06	58.05	63.45	83.72	88.33	109.18	108.97	67.50	74.34
BA233	F	12.67	3.08	42.02	80.78	60.96	60.03	84.55	83.34	108.99	108.23	72.10	70.45
HA292	F	13.00	3.00	46.75	77.07	62.65	65.33	87.05	88.40	104.51	102.88	74.86	77.74
ZI27	F	13.00	3.25	40.60	80.90	52.22	51.86	77.00	77.81	111.52	114.05	66.81	67.62
TO85	F	13.33	3.17	39.57	80.34	57.15	59.87	81.03	81.36	112.86	108.21	68.38	70.18
KO123	F	13.42	3.17	39.61	75.26	56.21	58.71	78.62	79.89	109.06	107.08	70.64	73.22
HA424	F	13.58	3.42	40.57	79.82	58.08	60.21	81.18	82.96	109.46	109.25	69.24	72.02
KE88	M	7.75	4.92	40.75	80.23	56.76	53.75	80.11	78.86	109.38	112.41	70.29	67.80
BR247	M	10.33	4.50	43.01	82.93	57.52	58.73	82.15	84.52	108.74	111.41	68.45	71.40
SU74	M	10.92	3.50	41.08	79.54	58.01	58.53	80.50	82.73	107.43	111.12	69.42	72.03
WA168	M	10.92	3.42	41.67	86.69	58.80	60.00	83.40	85.59	111.07	113.44	66.43	69.04
BH2	M	11.17	3.50	46.66	85.44	66.95	64.83	90.48	91.99	104.15	110.12	72.58	73.13
LA130	M	11.33	3.25	46.49	87.31	64.17	61.71	91.77	87.30	111.05	106.72	73.78	68.43
JA111	M	11.42	4.17	42.57	90.71	59.27	60.80	85.57	87.22	113.31	113.89	65.34	67.39
RO193	M	11.42	3.42	41.62	84.97	58.39	61.10	83.30	85.24	111.71	110.73	67.26	70.19
MO208	M	11.50	3.50	44.74	88.01	73.25	72.33	96.32	95.89	106.93	107.64	73.10	72.31
MY13	M	11.83	3.50	45.45	79.56	57.84	55.12	82.40	82.56	105.19	109.98	72.90	71.91
TI29	M	11.83	3.25	40.45	84.84	59.42	62.20	84.40	84.39	114.01	108.74	68.06	69.04
WA179	M	11.83	3.33	46.74	87.30	59.25	58.86	86.75	87.24	109.29	110.89	69.72	70.09
PE120	M	11.92	4.33	43.57	81.38	60.05	59.40	85.21	83.46	109.61	107.29	72.60	70.50
WI297	M	12.67	3.42	42.72	81.55	62.54	60.34	85.52	84.84	107.18	109.65	72.39	70.75
BR293	M	13.33	3.58	42.30	85.31	56.76	60.35	82.72	85.04	112.41	110.64	66.67	70.27
VA90	M	13.33	3.42	38.34	81.45	57.74	57.32	79.92	80.44	110.96	112.97	67.78	68.18
PO105	M	14.08	3.50	42.18	83.73	63.27	59.30	87.55	83.15	110.65	108.87	73.25	67.23
NA57	M	14.17	3.83	41.39	74.86	58.09	55.95	79.33	79.99	104.52	109.62	73.06	72.75
GR186	M	14.67	3.50	41.40	83.15	66.48	66.49	90.36	86.94	111.65	104.98	73.34	70.03

Distances in mm, Angles in degrees

Table IX - T2-T1 Changes in Distances and Angles

				Change in Distance T2-T1 (mm)						Change in Angles T2-T1 (degrees)			
ID	Sex	Age (YRS)	T2-T1 Interval (YRS)	RMef to LMef	RMf to LMf	RMf to RMef	LMf to LMef	RMf to LMef	LMf to RMef	a	b	c	d
GR149	F	7.83	3.75	0.75	7.14	5.16	6.94	5.86	6.65	1.75	0.09	-1.58	-0.25
RO217	F	8.17	3.33	-0.05	4.12	3.76	3.59	3.42	3.69	0.53	1.54	-1.26	-0.81
GR191	F	8.50	4.92	1.13	2.69	1.68	2.78	2.20	3.44	-0.18	0.44	-1.12	0.90
AL96	F	8.83	3.50	0.45	5.54	5.36	6.50	5.35	6.27	0.82	0.45	-1.20	-0.19
OE1	F	8.92	4.08	-0.39	1.52	1.97	2.16	1.66	1.69	0.43	0.17	-0.37	-0.24
MA306	F	9.33	4.08	-0.41	4.22	4.87	5.40	3.98	4.90	0.15	1.09	-1.20	-0.05
SU73	F	10.08	3.58	1.81	4.69	4.87	4.98	5.36	5.72	-0.33	0.01	0.03	0.32
MA296	F	10.17	4.92	0.07	3.40	4.47	4.73	4.15	3.92	0.52	-0.54	0.15	-0.12
KE79	F	11.17	5.67	1.14	3.41	3.66	4.11	3.89	4.41	-0.20	-0.04	-0.25	0.39
DA166	F	11.33	3.67	0.31	3.08	1.98	3.08	2.75	2.70	1.58	-0.36	-0.87	-0.45
NA42	F	11.67	3.58	1.30	1.92	2.33	1.11	3.03	1.61	0.10	-0.70	1.33	-0.79
LI82	F	11.83	3.17	-0.12	1.83	1.43	0.88	1.56	0.88	0.96	0.46	-0.16	-1.25
VI32	F	11.83	3.42	0.70	1.22	0.53	-0.33	1.25	0.16	0.60	-0.15	0.54	-1.00
HA403	F	12.00	3.42	0.96	3.18	3.28	4.73	3.73	4.50	0.41	-0.14	-0.95	0.68
FE52	F	12.58	3.50	0.62	1.95	2.19	3.64	1.85	3.83	-0.90	0.53	-1.28	1.61
KI7	F	12.58	3.58	0.74	3.33	4.14	8.02	4.25	6.61	0.25	-1.90	-1.05	2.73
BA233	F	12.67	3.08	0.44	1.95	2.42	2.21	2.42	2.25	-0.07	0.01	0.07	-0.15
HA292	F	13.00	3.00	-0.23	0.25	0.71	-0.18	0.36	-0.02	-0.14	0.49	0.29	-0.62
ZI27	F	13.00	3.25	-0.22	2.09	1.70	0.68	0.91	1.56	-0.90	2.60	-1.06	-0.64
TO85	F	13.33	3.17	0.63	1.11	1.54	1.23	1.71	1.47	-0.31	-0.14	0.47	0.08
KO123	F	13.42	3.17	-0.02	0.58	-0.05	-0.33	-0.13	0.14	-0.15	0.89	-0.43	-0.31
HA424	F	13.58	3.42	0.84	0.68	1.53	1.46	1.59	1.73	-0.83	-0.39	0.55	0.67
KE88	M	7.75	4.92	2.15	5.82	5.18	4.13	6.25	5.34	0.25	0.10	0.45	-0.86
BR247	M	10.33	4.50	0.11	5.70	5.51	5.67	5.49	5.33	1.39	0.64	-0.80	-1.22
SU74	M	10.92	3.50	0.77	4.50	3.80	3.94	4.30	4.25	0.90	0.41	-0.56	-0.75
WA168	M	10.92	3.42	1.84	4.34	4.47	4.26	5.24	4.92	-0.22	-0.69	0.73	0.17
BH2	M	11.17	3.50	1.24	3.34	6.45	4.32	5.79	4.77	-1.13	0.10	1.56	-0.54
LA130	M	11.33	3.25	1.12	4.07	5.90	2.75	5.94	3.33	-0.17	0.27	1.81	-1.86
JA111	M	11.42	4.17	-0.17	4.43	5.45	5.18	4.69	4.65	0.01	0.40	-0.06	-0.31
RO193	M	11.42	3.42	1.77	4.89	3.28	3.71	4.72	4.40	1.05	-0.47	-0.15	-0.53
MO208	M	11.50	3.50	1.58	4.75	6.76	4.96	6.58	5.93	-1.00	0.74	0.84	-0.55
MY13	M	11.83	3.50	0.81	3.45	5.58	5.19	4.80	5.18	-0.96	0.29	0.24	0.50
TI29	M	11.83	3.25	-0.35	5.59	4.07	4.42	4.08	4.33	1.60	1.38	-1.70	-1.42
WA179	M	11.83	3.33	0.66	5.94	3.83	4.39	4.34	5.12	1.07	1.65	-1.89	-0.82
PE120	M	11.92	4.33	1.00	3.78	6.12	5.28	5.82	5.11	-0.54	-0.36	0.98	-0.02
WI297	M	12.67	3.42	1.24	3.63	3.31	2.70	5.01	2.40	2.40	-1.89	1.31	-1.71
BR293	M	13.33	3.58	0.26	0.09	0.39	0.17	0.33	0.38	-0.47	0.07	0.20	0.20
VA90	M	13.33	3.42	1.04	4.35	5.63	4.13	5.92	4.17	0.32	-0.74	1.48	-1.11
PO105	M	14.08	3.50	0.19	2.78	3.29	2.12	3.24	2.19	0.35	0.40	0.29	-1.03
NA57	M	14.17	3.83	0.75	1.95	6.38	3.07	5.16	3.23	-1.71	-0.02	2.85	-1.11
GR186	M	14.67	3.50	-0.03	0.24	1.22	1.48	0.94	1.16	-0.28	-0.25	0.08	0.45

Table X - Distance Change Between Mental Foramina
Overall 3D Change vs Change on Transverse Axis (T2-T1)

	A	B	A-B
ID	RMef to LMef 3D Distance Change (mm)	Total Change in RMef & LMef on Transverse Axis (mm)	Discrepancy (mm)
PE120	1.00	1.00	0.00
VI32	0.70	0.70	0.00
MA296	0.07	0.07	0.00
VA90	1.04	1.03	0.00
HA403	0.96	0.97	-0.01
MA306	-0.41	-0.40	-0.01
LI82	-0.12	-0.13	0.01
ZI27	-0.22	-0.23	0.01
FE52	0.62	0.63	-0.01
KO123	-0.02	0.00	-0.02
KE88	2.15	2.13	0.02
MY13	0.81	0.83	-0.02
BR247	0.11	0.13	-0.02
OE1	-0.39	-0.37	-0.02
HA424	0.84	0.87	-0.02
HA292	-0.23	-0.20	-0.03
TO85	0.63	0.60	0.03
WA179	0.66	0.63	0.03
BA233	0.44	0.47	-0.03
KI7	0.74	0.77	-0.03
GR186	-0.03	0.00	-0.03
JA111	-0.17	-0.20	0.03
SU74	0.77	0.73	0.03
NA42	1.30	1.33	-0.04
DA166	0.31	0.27	0.04
LA130	1.12	1.17	-0.05
NA57	0.75	0.70	0.05
MO208	1.58	1.63	-0.05
GR149	0.75	0.70	0.05
GR191	1.13	1.20	-0.07
BR293	0.26	0.33	-0.07
WI297	1.24	1.17	0.07
WA168	1.84	1.77	0.08
TI29	-0.35	-0.43	0.08
RO217	-0.05	0.03	-0.08
SU73	1.81	1.90	-0.09
RO193	1.77	1.67	0.10
BH2	1.24	1.10	0.14
KE79	1.14	1.00	0.14
AL96	0.45	0.30	0.15
PO105	0.19	-0.07	0.26

Table XI - Distance Change Between Mandibular Foramina
Overall 3D Change vs Change on Transverse Axis (T2-T1)

	A	B	A-B
ID	RMf to LMf 3D Distance Change (mm)	Total Change in RMf & LMf on Transverse Axis (mm)	Discrepancy (mm)
MA296	3.40	3.40	0.00
BR247	5.70	5.70	0.00
BH2	3.34	3.33	0.00
KE79	3.41	3.33	-0.01
LI82	1.83	1.83	-0.01
DA166	3.08	3.07	0.01
FE52	1.95	1.93	0.01
PE120	3.78	3.80	0.01
ZI27	2.09	2.10	-0.01
NA42	1.92	1.93	-0.01
KE88	5.82	5.83	-0.02
KO123	0.58	0.57	0.02
MY13	3.45	3.47	-0.02
VI32	1.22	1.20	0.02
MA306	4.22	4.20	0.02
GR186	0.24	0.27	-0.03
AL96	5.54	5.50	0.04
GR191	2.69	2.73	-0.04
HA403	3.18	3.13	0.05
MO208	4.75	4.70	0.05
OE1	1.52	1.47	0.06
TO85	1.11	1.17	-0.06
JA111	4.43	4.37	0.06
BA233	1.95	2.03	-0.07
WA179	5.94	5.87	0.08
GR149	7.14	7.07	0.08
HA424	0.68	0.60	0.08
SU74	4.50	4.40	0.10
KI7	3.33	3.23	0.10
SU73	4.69	4.80	-0.11
VA90	4.35	4.23	0.11
BR293	0.09	0.23	-0.14
WI297	3.63	3.47	0.16
RO217	4.12	4.30	-0.18
LA130	4.07	4.30	-0.20
WA168	4.34	4.13	0.21
HA292	0.25	0.03	0.22
RO193	4.89	4.63	0.26
NA57	1.95	2.13	-0.30
PO105	2.78	2.43	0.35
TI29	5.59	5.40	-0.39

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NOTICE OF APPROVAL

CWRU IRB Protocol Number:	**IRB-2013-371**
Protocol Title:	***Mandibular Growth Study: Three Dimensional Evaluation of Movement of the Mental & Mandibular Foramina Relative to Each Other During Normal Growth***
Responsible Investigator (RI):	**Mark Hans**
Co-Investigator (CI):	**Fariha Samad**
RI Department:	**Orthodontics**
Type of Review:	**Expedited**
Risk Level:	**Minimal**
Vulnerable Population(s):	**Children**
Approval Date:	**02/28/2013**
CONTINUING REVIEW DEADLINE:	**02/13/2014**
EXPIRATION DATE:	**02/27/2014**

The CWRU Institutional Review Board (IRB) has approved the above new protocol through the **EXPEDITED** review process.

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.90	-65.47	-21.97
Landmark 2	Lmef	23.53	-63.37	-19.20
Landmark 3	RMf	-36.10	-29.23	-64.20
Landmark 4	LMf	42.63	-27.73	-60.53

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.26	0.15	0.06
Landmark 2	Lmef	0.23	0.21	0.10
Landmark 3	RMf	0.26	0.21	0.20
Landmark 4	LMf	0.35	0.25	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.70	-65.60	-22.00	-17.80	-65.50	-21.90	-18.20	-65.30	-22.00
Landmark 2	Lmef	23.40	-63.60	-19.10	23.40	-63.20	-19.20	23.80	-63.30	-19.30
Landmark 3	RMf	-36.40	-29.00	-64.20	-35.90	-29.40	-64.00	-36.00	-29.30	-64.40
Landmark 4	LMf	43.00	-27.50	-60.50	42.30	-28.00	-60.60	42.60	-27.70	-60.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.43	-2.10	-2.77	41.58
RMf to LMf	-78.73	-1.50	-3.67	78.83
RMf to Rmef	-18.20	36.23	-42.23	58.55
LMf to Lmef	19.10	35.63	-41.33	57.82
RMf to Lmef	-59.63	34.13	-45.00	82.14
LMf to Rmef	60.53	37.73	-38.57	81.09

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.63	-69.93	-19.27
Landmark 2	Lmef	24.27	-67.80	-17.00
Landmark 3	RMf	-37.13	-31.67	-62.53
Landmark 4	LMf	43.63	-31.73	-60.90

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.29	0.06	0.25
Landmark 2	Lmef	0.21	0.10	0.10
Landmark 3	RMf	0.25	0.23	0.06
Landmark 4	LMf	0.15	0.12	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.80	-69.90	-19.50	-17.30	-70.00	-19.00	-17.80	-69.90	-19.30
Landmark 2	Lmef	24.20	-67.80	-17.10	24.10	-67.90	-17.00	24.50	-67.70	-16.90
Landmark 3	RMf	-37.10	-31.40	-62.50	-37.40	-31.80	-62.50	-36.90	-31.80	-62.60
Landmark 4	LMf	43.50	-31.80	-61.00	43.80	-31.60	-60.80	43.60	-31.80	-60.90

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.90	-2.13	-2.27	42.02
RMf to LMf	-80.77	0.07	-1.63	80.78
RMf to Rmef	-19.50	38.27	-43.27	60.96
LMf to Lmef	19.37	36.07	-43.90	60.03
RMf to Lmef	-61.40	36.13	-45.53	84.55
LMf to Rmef	61.27	38.20	-41.63	83.34

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.44
RMf to LMf	1.95
RMf to Rmef	2.42
LMf to Lmef	2.21
RMf to Lmef	2.42
LMf to Rmef	2.25

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.70	36.60	-42.20	58.91	-18.10	36.10	-42.10	58.34	-17.80	36.00	-42.40	58.40
RMef-LMef	B	-41.10	-2.00	-2.90	41.25	-41.20	-2.30	-2.70	41.35	-42.00	-2.00	-2.70	42.13
LMf-Lmef	C	19.60	36.10	-41.40	58.32	18.90	35.20	-41.40	57.53	18.80	35.60	-41.20	57.60
RMf-LMf	D	-79.40	-1.50	-3.70	79.50	-78.20	-1.40	-3.40	78.29	-78.60	-1.60	-3.90	78.71
RMf-Lmef	E	-59.80	34.60	-45.10	82.51	-59.30	33.80	-44.80	81.65	-59.80	34.00	-45.10	82.26
LMf-Rmef	F	60.70	38.10	-38.50	81.35	60.10	37.50	-38.70	80.72	60.80	37.60	-38.50	81.20

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.67		1.90	108.77		1.90	108.73
b	BCF	1.89	108.36		1.89	108.32		1.88	107.99
c	CDE	1.25	71.68		1.26	72.07		1.26	72.36
d	ADF	1.23	70.20		1.23	70.72		1.24	70.86
Sum			359.91			359.88			359.94

T1 Average Angles	
Angles	Degrees
a	109.06
b	108.22
c	72.04
d	70.60
Sum	359.91

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.30	38.50	-43.00	60.86	-20.10	38.20	-43.50	61.28	-19.10	38.10	-43.30	60.76
RMef-LMef	B	-42.00	-2.10	-2.40	42.12	-41.40	-2.10	-2.00	41.50	-42.30	-2.20	-2.40	42.43
LMf-Lmef	C	19.30	36.00	-43.90	59.96	19.70	36.30	-43.80	60.20	19.10	35.90	-44.00	59.91
RMf-LMf	D	-80.60	0.40	-1.50	80.61	-81.20	-0.20	-1.70	81.22	-80.50	0.00	-1.70	80.52
RMf-Lmef	E	-61.30	36.40	-45.40	84.52	-61.50	36.10	-45.50	84.59	-61.40	35.90	-45.70	84.54
LMf-Rmef	F	61.30	38.10	-41.50	83.26	61.10	38.40	-41.80	83.40	61.40	38.10	-41.60	83.38

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.90	108.96		1.91	109.26		1.90	108.74
b	BCF	1.89	108.01		1.90	108.78		1.88	107.90
c	CDE	1.26	72.23		1.25	71.73		1.26	72.35
d	ADF	1.23	70.53		1.22	70.05		1.24	70.77
Sum			**359.73**			**359.82**			**359.76**

T2 Average Angles		
Angles		Degrees
a		108.99
b		108.23
c		72.10
d		70.45
Sum		**359.77**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	**-0.07**
b	**0.01**
c	**0.07**
d	**-0.15**

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.40	-40.50	-7.90
Landmark 2	Lmef	18.90	-43.17	-8.77
Landmark 3	RMf	-33.03	-12.77	-47.00
Landmark 4	LMf	35.43	-15.40	-46.60

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.17	0.20	0.10
Landmark 2	Lmef	0.10	0.15	0.06
Landmark 3	RMf	0.12	0.06	0.17
Landmark 4	LMf	0.06	0.36	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.60	-40.30	-7.80	-19.30	-40.50	-7.90	-19.30	-40.70	-8.00
Landmark 2	Lmef	18.80	-43.30	-8.80	19.00	-43.00	-8.70	18.90	-43.20	-8.80
Landmark 3	RMf	-33.10	-12.80	-46.80	-32.90	-12.70	-47.10	-33.10	-12.80	-47.10
Landmark 4	LMf	35.40	-15.50	-46.60	35.50	-15.00	-46.80	35.40	-15.70	-46.40

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-38.30	2.67	0.87	38.40
RMf to LMf	-68.47	2.63	-0.40	68.52
RMf to Rmef	-13.63	27.73	-39.10	49.84
LMf to Lmef	16.53	27.77	-37.83	49.76
RMf to Lmef	-51.93	30.40	-38.23	71.30
LMf to Rmef	54.83	25.10	-38.70	71.65

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.07	-43.67	-7.63
Landmark 2	Lmef	20.43	-44.83	-8.80
Landmark 3	RMf	-34.47	-16.53	-48.63
Landmark 4	LMf	36.73	-16.37	-49.83

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.29	0.15	0.15
Landmark 2	Lmef	0.12	0.15	0.10
Landmark 3	RMf	0.06	0.31	0.15
Landmark 4	LMf	0.15	0.21	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.90	-43.80	-7.80	-19.40	-43.50	-7.50	-18.90	-43.70	-7.60
Landmark 2	Lmef	20.50	-45.00	-8.90	20.30	-44.80	-8.70	20.50	-44.70	-8.80
Landmark 3	RMf	-34.40	-16.20	-48.80	-34.50	-16.80	-48.50	-34.50	-16.60	-48.60
Landmark 4	LMf	36.70	-16.30	-50.00	36.60	-16.20	-49.90	36.90	-16.60	-49.60

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.50	1.17	1.17	39.53
RMf to LMf	-71.20	-0.17	1.20	71.21
RMf to Rmef	-15.40	27.13	-41.00	51.52
LMf to Lmef	16.30	28.47	-41.03	52.53
RMf to Lmef	-54.90	28.30	-39.83	73.50
LMf to Rmef	55.80	27.30	-42.20	75.10

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.13
RMf to LMf	2.69
RMf to Rmef	1.68
LMf to Lmef	2.78
RMf to Lmef	2.20
LMf to Rmef	3.44

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-13.50	27.50	-39.00	49.59	-13.60	27.80	-39.20	49.94	-13.80	27.90	-39.10	49.98
RMef-LMef	B	-38.40	3.00	1.00	38.53	-38.30	2.50	0.80	38.39	-38.20	2.50	0.80	38.29
LMf-Lmef	C	16.60	27.80	-37.80	49.77	16.50	28.00	-38.10	50.08	16.50	27.50	-37.60	49.42
RMf-LMf	D	-68.50	2.70	-0.20	68.55	-68.40	2.30	-0.30	68.44	-68.50	2.90	-0.70	68.56
RMf-Lmef	E	-51.90	30.50	-38.00	71.19	-51.90	30.30	-38.40	71.32	-52.00	30.40	-38.30	71.38
LMf-Rmef	F	55.00	24.80	-38.80	71.73	54.80	25.50	-38.90	71.88	54.70	25.00	-38.40	71.36

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.10	1.87	106.95	1.87	107.19
b	BCF	1.88	107.98	1.88	107.95	1.89	108.22
c	CDE	1.26	72.00	1.26	72.11	1.26	72.41
d	ADF	1.27	72.77	1.27	72.88	1.26	72.09
Sum			359.85		359.90		359.91

T1 Average Angles	
Angles	Degrees
a	107.08
b	108.05
c	72.17
d	72.58
Sum	359.89

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-15.50	27.60	-41.00	51.80	-15.10	26.70	-41.00	51.20	-15.60	27.10	-41.00	51.56
RMef-LMef	B	-39.40	1.20	1.10	39.43	-39.70	1.30	1.20	39.74	-39.40	1.00	1.20	39.43
LMf-Lmef	C	16.20	28.70	-41.10	52.68	16.30	28.60	-41.20	52.74	16.40	28.10	-40.80	52.18
RMf-LMf	D	-71.10	0.10	1.20	71.11	-71.10	-0.60	1.40	71.12	-71.40	0.00	1.00	71.41
RMf-Lmef	E	-54.90	28.80	-39.90	73.73	-54.80	28.00	-39.80	73.29	-55.00	28.10	-39.80	73.48
LMf-Rmef	F	55.60	27.50	-42.20	75.02	56.00	27.30	-42.40	75.36	55.80	27.10	-42.00	74.91

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.04		1.86	106.71		1.87	106.94
b	BCF	1.89	108.21		1.89	108.34		1.90	108.91
c	CDE	1.25	71.35		1.24	70.79		1.24	71.02
d	ADF	1.28	73.35		1.29	74.06		1.28	73.06
Sum			359.94			359.90			359.94

T2 Average Angles		
Angles		Degrees
a		106.90
b		108.49
c		71.05
d		73.49
Sum		359.93

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.18
b	0.44
c	-1.12
d	0.90

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-13.73	-49.17	-19.87
Landmark 2	Lmef	28.53	-44.13	-17.90
Landmark 3	RMf	-31.00	-16.03	-59.47
Landmark 4	LMf	45.53	-8.17	-57.53

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.06	0.23
Landmark 2	Lmef	0.15	0.50	0.26
Landmark 3	RMf	0.10	0.55	0.38
Landmark 4	LMf	0.06	0.49	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-13.80	-49.20	-19.60	-13.50	-49.20	-20.00	-13.90	-49.10	-20.00
Landmark 2	Lmef	28.50	-44.20	-17.80	28.40	-44.60	-18.20	28.70	-43.60	-17.70
Landmark 3	RMf	-31.10	-15.40	-59.90	-30.90	-16.40	-59.30	-31.00	-16.30	-59.20
Landmark 4	LMf	45.50	-7.60	-57.70	45.50	-8.50	-57.40	45.60	-8.40	-57.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.27	-5.03	-1.97	42.61
RMf to LMf	-76.53	-7.87	-1.93	76.96
RMf to Rmef	-17.27	33.13	-39.60	54.44
LMf to Lmef	17.00	35.97	-39.63	56.16
RMf to Lmef	-59.53	28.10	-41.57	77.86
LMf to Rmef	59.27	41.00	-37.67	81.32

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-13.57	-60.10	-16.00
Landmark 2	Lmef	29.00	-54.53	-12.70
Landmark 3	RMf	-32.90	-21.73	-57.60
Landmark 4	LMf	49.13	-13.30	-55.37

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.17	0.17
Landmark 2	Lmef	0.17	0.15	0.10
Landmark 3	RMf	0.10	0.12	0.10
Landmark 4	LMf	0.29	0.40	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-13.50	-60.30	-16.20	-13.60	-60.00	-15.90	-13.60	-60.00	-15.90
Landmark 2	Lmef	28.80	-54.50	-12.60	29.10	-54.40	-12.80	29.10	-54.70	-12.70
Landmark 3	RMf	-33.00	-21.80	-57.50	-32.90	-21.80	-57.60	-32.80	-21.60	-57.70
Landmark 4	LMf	49.30	-12.90	-55.30	48.80	-13.30	-55.50	49.30	-13.70	-55.30

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.57	-5.57	-3.30	43.06
RMf to LMf	-82.03	-8.43	-2.23	82.50
RMf to Rmef	-19.33	38.37	-41.60	59.80
LMf to Lmef	20.13	41.23	-42.67	62.66
RMf to Lmef	-61.90	32.80	-44.90	83.21
LMf to Rmef	62.70	46.80	-39.37	87.59

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.45
RMf to LMf	5.54
RMf to Rmef	5.36
LMf to Lmef	6.50
RMf to Lmef	5.35
LMf to Rmef	6.27

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.30	33.80	-40.30	55.37	-17.40	32.80	-39.30	54.07	-17.10	32.80	-39.20	53.90
RMef-LMef	B	-42.30	-5.00	-1.80	42.63	-41.90	-4.60	-1.80	42.19	-42.60	-5.50	-2.30	43.02
LMf-Lmef	C	17.00	36.60	-39.90	56.75	17.10	36.10	-39.20	55.97	16.90	35.20	-39.80	55.76
RMf-LMf	D	-76.60	-7.80	-2.20	77.03	-76.40	-7.90	-1.90	76.83	-76.60	-7.90	-1.70	77.03
RMf-Lmef	E	-59.60	28.80	-42.10	78.45	-59.30	28.20	-41.10	77.47	-59.70	27.30	-41.50	77.66
LMf-Rmef	F	59.30	41.60	-38.10	81.85	59.00	40.70	-37.40	80.85	59.50	40.70	-37.50	81.26

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.84	105.61	1.86	106.53	1.85	105.98
b	BCF	1.92	110.07	1.92	110.11	1.92	110.04
c	CDE	1.22	69.93	1.21	69.34	1.21	69.49
d	ADF	1.30	74.35	1.29	74.00	1.30	74.39
Sum			**359.97**		**359.98**		**359.90**

T1 Average Angles	
Angles	Degrees
a	106.04
b	110.08
c	69.59
d	74.25
Sum	**359.95**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.50	38.50	-41.30	59.73	-19.30	38.20	-41.70	59.75	-19.20	38.40	-41.80	59.92
RMef-LMef	B	-42.30	-5.80	-3.60	42.85	-42.70	-5.60	-3.10	43.18	-42.70	-5.30	-3.20	43.15
LMf-Lmef	C	20.50	41.60	-42.70	63.04	19.70	41.10	-42.70	62.45	20.20	41.00	-42.60	62.48
RMf-LMf	D	-82.30	-8.90	-2.20	82.81	-81.70	-8.50	-2.10	82.17	-82.10	-7.90	-2.40	82.51
RMf-Lmef	E	-61.80	32.70	-44.90	83.09	-62.00	32.60	-44.80	83.15	-61.90	33.10	-45.00	83.38
LMf-Rmef	F	62.80	47.40	-39.10	87.86	62.40	46.70	-39.60	87.42	62.90	46.30	-39.40	87.48

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.04		1.86	106.66		1.87	106.87
b	BCF	1.93	110.70		1.93	110.38		1.93	110.49
c	CDE	1.19	67.91		1.20	68.64		1.20	68.61
d	ADF	1.29	74.13		1.29	74.17		1.29	73.87
Sum			359.78			359.84			359.84

T2 Average Angles		
Angles		Degrees
a		106.86
b		110.52
c		68.39
d		74.06
Sum		359.82

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.82
b	0.45
c	-1.20
d	-0.19

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-22.57	-44.20	-8.10
Landmark 2	Lmef	22.83	-42.77	-7.93
Landmark 3	RMf	-39.33	-12.67	-56.93
Landmark 4	LMf	42.70	-10.10	-54.83

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.32	0.36	0.26
Landmark 2	Lmef	0.35	0.25	0.15
Landmark 3	RMf	0.35	0.51	0.60
Landmark 4	LMf	0.35	0.26	0.40

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-22.20	-44.60	-7.90	-22.70	-44.10	-8.40	-22.80	-43.90	-8.00
Landmark 2	Lmef	22.50	-43.00	-7.90	23.20	-42.50	-8.10	22.80	-42.80	-7.80
Landmark 3	RMf	-39.30	-12.80	-57.00	-39.00	-13.10	-56.30	-39.70	-12.10	-57.50
Landmark 4	LMf	42.90	-10.40	-54.60	42.30	-10.00	-55.30	42.90	-9.90	-54.60

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-45.40	-1.43	-0.17	45.42
RMf to LMf	-82.03	-2.57	-2.10	82.10
RMf to Rmef	-16.77	31.53	-48.83	60.50
LMf to Lmef	19.87	32.67	-46.90	60.51
RMf to Lmef	-62.17	30.10	-49.00	84.69
LMf to Rmef	65.27	34.10	-46.73	87.22

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.13	-47.40	2.40
Landmark 2	Lmef	25.37	-45.20	-0.77
Landmark 3	RMf	-42.80	-14.07	-51.47
Landmark 4	LMf	42.57	-11.07	-53.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.17	0.10
Landmark 2	Lmef	0.12	0.17	0.06
Landmark 3	RMf	0.00	0.40	0.12
Landmark 4	LMf	0.23	0.12	0.65

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.20	-47.30	2.40	-21.30	-47.30	2.30	-20.90	-47.60	2.50
Landmark 2	Lmef	25.30	-45.30	-0.70	25.50	-45.00	-0.80	25.30	-45.30	-0.80
Landmark 3	RMf	-42.80	-14.00	-51.60	-42.80	-14.50	-51.40	-42.80	-13.70	-51.40
Landmark 4	LMf	42.70	-11.20	-53.80	42.30	-11.00	-52.50	42.70	-11.00	-53.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.50	-2.20	3.17	46.66
RMf to LMf	-85.37	-3.00	1.67	85.44
RMf to Rmef	-21.67	33.33	-53.87	66.95
LMf to Lmef	17.20	34.13	-52.37	64.83
RMf to Lmef	-68.17	31.13	-50.70	90.48
LMf to Rmef	63.70	36.33	-55.53	91.99

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.24
RMf to LMf	3.34
RMf to Rmef	6.45
LMf to Lmef	4.32
RMf to Lmef	5.79
LMf to Rmef	4.77

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.10	31.80	-49.10	60.95	-16.30	31.00	-47.90	59.34	-16.90	31.80	-49.50	61.21
RMef-LMef	B	-44.70	-1.60	0.00	44.73	-45.90	-1.60	-0.30	45.93	-45.60	-1.10	-0.20	45.61
LMf-Lmef	C	20.40	32.60	-46.70	60.50	19.10	32.50	-47.20	60.41	20.10	32.90	-46.80	60.64
RMf-LMf	D	-82.20	-2.40	-2.40	82.27	-81.30	-3.10	-1.00	81.37	-82.60	-2.20	-2.90	82.68
RMf-Lmef	E	-61.80	30.20	-49.10	84.51	-62.20	29.40	-48.20	84.00	-62.50	30.70	-49.70	85.55
LMf-Rmef	F	65.10	34.20	-46.70	87.11	65.00	34.10	-46.90	87.11	65.70	34.00	-46.60	87.43

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.84	105.17		1.84	105.16		1.84	105.49
b	BCF	1.94	110.87		1.91	109.25		1.92	109.94
c	CDE	1.23	70.72		1.24	70.92		1.25	71.43
d	ADF	1.28	73.22		1.30	74.66		1.28	73.12
Sum			**359.99**			**360.00**			**359.98**

T1 Average Angles	
Angles	Degrees
a	105.27
b	110.02
c	71.02
d	73.67
Sum	**359.99**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.60	33.30	-54.00	67.02	-21.50	32.80	-53.70	66.50	-21.90	33.90	-53.90	67.34
RMef-LMef	B	-46.50	-2.00	3.10	46.65	-46.80	-2.30	3.10	46.96	-46.20	-2.30	3.30	46.37
LMf-Lmef	C	17.40	34.10	-53.10	65.46	16.80	34.00	-51.70	64.12	17.40	34.30	-52.30	64.92
RMf-LMf	D	-85.50	-2.80	2.20	85.57	-85.10	-3.50	1.10	85.18	-85.50	-2.70	1.70	85.56
RMf-Lmef	E	-68.10	31.30	-50.90	90.60	-68.30	30.50	-50.60	90.31	-68.10	31.60	-50.60	90.53
LMf-Rmef	F	63.90	36.10	-56.20	92.44	63.60	36.30	-54.80	91.46	63.60	36.60	-55.60	92.06

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.82	104.27		1.82	104.17		1.82	104.01
b	BCF	1.92	109.95		1.92	109.90		1.93	110.52
c	CDE	1.26	72.33		1.27	72.90		1.27	72.51
d	ADF	1.28	73.44		1.27	73.00		1.27	72.95
Sum			359.99			359.97			359.99

T2 Average Angles		
Angles		Degrees
a		104.15
b		110.12
c		72.58
d		73.13
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-1.13
b	0.10
c	1.56
d	-0.54

F 11 04 03 08

T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.60	-48.67	5.77
Landmark 2	Lmef	23.67	-49.17	5.30
Landmark 3	RMf	-37.47	-17.33	-39.80
Landmark 4	LMf	39.83	-15.03	-39.87

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.26	0.15	0.15
Landmark 2	Lmef	0.15	0.21	0.00
Landmark 3	RMf	0.06	0.38	0.17
Landmark 4	LMf	0.06	0.81	0.25

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.90	-48.50	5.80	-19.50	-48.80	5.60	-19.40	-48.70	5.90
Landmark 2	Lmef	23.70	-49.00	5.30	23.80	-49.10	5.30	23.50	-49.40	5.30
Landmark 3	RMf	-37.50	-17.60	-39.70	-37.50	-16.90	-40.00	-37.40	-17.50	-39.70
Landmark 4	LMf	39.80	-14.90	-40.10	39.80	-14.30	-39.90	39.90	-15.90	-39.60

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-43.27	0.50	0.47	43.27
RMf to LMf	-77.30	-2.30	0.07	77.33
RMf to Rmef	-17.87	31.33	-45.57	58.11
LMf to Lmef	16.17	34.13	-45.17	58.88
RMf to Lmef	-61.13	31.83	-45.10	82.37
LMf to Rmef	59.43	33.63	-45.63	82.13

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.60	-51.53	1.63
Landmark 2	Lmef	21.93	-53.43	2.43
Landmark 3	RMf	-39.27	-19.83	-46.27
Landmark 4	LMf	41.10	-17.87	-44.53

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.00	0.06	0.06
Landmark 2	Lmef	0.06	0.15	0.06
Landmark 3	RMf	0.23	0.25	0.06
Landmark 4	LMf	0.10	0.15	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.60	-51.50	1.70	-21.60	-51.60	1.60	-21.60	-51.50	1.60
Landmark 2	Lmef	21.90	-53.60	2.40	22.00	-53.30	2.50	21.90	-53.40	2.40
Landmark 3	RMf	-39.40	-20.10	-46.20	-39.00	-19.60	-46.30	-39.40	-19.80	-46.30
Landmark 4	LMf	41.10	-18.00	-44.50	41.00	-17.90	-44.60	41.20	-17.70	-44.50

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-43.53	1.90	-0.80	43.58
RMf to LMf	-80.37	-1.97	-1.73	80.41
RMf to Rmef	-17.67	31.70	-47.90	60.10
LMf to Lmef	19.17	35.57	-46.97	61.95
RMf to Lmef	-61.20	33.60	-48.70	85.12
LMf to Rmef	62.70	33.67	-46.17	84.83

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.31
RMf to LMf	3.08
RMf to Rmef	1.98
LMf to Lmef	3.08
RMf to Lmef	2.75
LMf to Rmef	2.70

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.60	30.90	-45.50	57.75	-18.00	31.90	-45.60	58.49	-18.00	31.20	-45.60	58.11
RMef-LMef	B	-43.60	0.50	0.50	43.61	-43.30	0.30	0.30	43.30	-42.90	0.70	0.60	42.91
LMf-Lmef	C	16.10	34.10	-45.40	59.02	16.00	34.80	-45.20	59.25	16.40	33.50	-44.90	58.37
RMf-LMf	D	-77.30	-2.70	0.40	77.35	-77.30	-2.60	-0.10	77.34	-77.30	-1.60	-0.10	77.32
RMf-Lmef	E	-61.20	31.40	-45.00	82.20	-61.30	32.20	-45.30	82.74	-60.90	31.90	-45.00	82.17
LMf-Rmef	F	59.70	33.60	-45.90	82.46	59.30	34.50	-45.50	82.32	59.30	32.80	-45.50	81.62

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.88	107.57	1.88	107.83	1.88	107.91
b	BCF	1.85	105.96	1.85	105.74	1.86	106.40
c	CDE	1.27	72.74	1.28	73.22	1.27	73.04
d	ADF	1.29	73.63	1.28	73.13	1.27	72.57
Sum		**359.89**		**359.91**		**359.91**	

T1 Average Angles	
Angles	Degrees
a	107.77
b	106.03
c	73.00
d	73.11
Sum	**359.90**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.80	31.40	-47.90	59.98	-17.40	32.00	-47.90	60.18	-17.80	31.70	-47.90	60.13
RMef-LMef	B	-43.50	2.10	-0.70	43.56	-43.60	1.70	-0.90	43.64	-43.50	1.90	-0.80	43.55
LMf-Lmef	C	19.20	35.60	-46.90	61.93	19.00	35.40	-47.10	61.91	19.30	35.70	-46.90	62.02
RMf-LMf	D	-80.50	-2.10	-1.70	80.55	-80.00	-1.70	-1.70	80.04	-80.60	-2.10	-1.80	80.65
RMf-Lmef	E	-61.30	33.50	-48.60	85.10	-61.00	33.70	-48.80	85.08	-61.30	33.60	-48.70	85.20
LMf-Rmef	F	62.70	33.50	-46.20	84.78	62.60	33.70	-46.20	84.79	62.80	33.80	-46.10	84.92

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.54		1.90	109.03		1.91	109.47
b	BCF	1.84	105.65		1.84	105.58		1.85	105.77
c	CDE	1.26	72.01		1.26	72.38		1.26	71.99
d	ADF	1.27	72.55		1.27	72.86		1.27	72.55
Sum			359.75			359.85			359.79

T2 Average Angles		
Angles		Degrees
a		109.35
b		105.67
c		72.13
d		72.66
Sum		359.80

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.58
b	-0.36
c	-0.87
d	-0.45

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.77	-55.57	-16.90
Landmark 2	Lmef	26.10	-53.90	-19.00
Landmark 3	RMf	-38.37	-17.20	-53.13
Landmark 4	LMf	38.50	-15.37	-56.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.06	0.10
Landmark 2	Lmef	0.10	0.10	0.10
Landmark 3	RMf	0.21	0.20	0.38
Landmark 4	LMf	0.30	0.57	0.23

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.00	-55.50	-17.00	-18.70	-55.60	-16.80	-18.60	-55.60	-16.90
Landmark 2	Lmef	26.20	-53.90	-19.00	26.00	-54.00	-19.10	26.10	-53.80	-18.90
Landmark 3	RMf	-38.60	-17.20	-53.30	-38.20	-17.40	-52.70	-38.30	-17.00	-53.40
Landmark 4	LMf	38.50	-16.00	-56.00	38.20	-15.20	-56.00	38.80	-14.90	-56.40

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-44.87	-1.67	2.10	44.95
RMf to LMf	-76.87	-1.83	3.00	76.95
RMf to Rmef	-19.60	38.37	-36.23	56.29
LMf to Lmef	12.40	38.53	-37.13	54.93
RMf to Lmef	-64.47	36.70	-34.13	81.66
LMf to Rmef	57.27	40.20	-39.23	80.22

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.53	-60.10	-20.60
Landmark 2	Lmef	25.97	-57.77	-21.40
Landmark 3	RMf	-38.57	-17.70	-56.10
Landmark 4	LMf	40.23	-15.07	-58.87

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.35	0.17
Landmark 2	Lmef	0.06	0.06	0.00
Landmark 3	RMf	0.15	0.20	0.10
Landmark 4	LMf	0.46	0.15	0.25

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.50	-59.90	-20.50	-19.60	-59.90	-20.50	-19.50	-60.50	-20.80
Landmark 2	Lmef	25.90	-57.80	-21.40	26.00	-57.70	-21.40	26.00	-57.80	-21.40
Landmark 3	RMf	-38.60	-17.50	-56.00	-38.40	-17.70	-56.10	-38.70	-17.90	-56.20
Landmark 4	LMf	39.70	-14.90	-58.60	40.50	-15.10	-58.90	40.50	-15.20	-59.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-45.50	-2.33	0.80	45.57
RMf to LMf	-78.80	-2.63	2.77	78.89
RMf to Rmef	-19.03	42.40	-35.50	58.48
LMf to Lmef	14.27	42.70	-37.47	58.57
RMf to Lmef	-64.53	40.07	-34.70	83.51
LMf to Rmef	59.77	45.03	-38.27	84.05

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.62
RMf to LMf	1.95
RMf to Rmef	2.19
LMf to Lmef	3.64
RMf to Lmef	1.85
LMf to Rmef	3.83

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.60	38.30	-36.30	56.29	-19.50	38.20	-35.90	55.93	-19.70	38.60	-36.50	56.66
RMef-LMef	B	-45.20	-1.60	2.00	45.27	-44.70	-1.60	2.30	44.79	-44.70	-1.80	2.00	44.78
LMf-Lmef	C	12.30	37.90	-37.00	54.38	12.20	38.80	-36.90	54.92	12.70	38.90	-37.50	55.50
RMf-LMf	D	-77.10	-1.20	2.70	77.16	-76.40	-2.20	3.30	76.50	-77.10	-2.10	3.00	77.19
RMf-Lmef	E	-64.80	36.70	-34.30	81.99	-64.20	36.60	-33.60	81.18	-64.40	36.80	-34.50	81.80
LMf-Rmef	F	57.50	39.50	-39.00	79.92	56.90	40.40	-39.20	80.04	57.40	40.70	-39.50	80.69

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.16	1.87	106.89	1.87	106.91
b	BCF	1.86	106.29	1.86	106.35	1.86	106.66
c	CDE	1.31	74.89	1.30	74.27	1.29	74.10
d	ADF	1.25	71.65	1.27	72.49	1.26	72.32
Sum			360.00		360.00		360.00

T1 Average Angles	
Angles	Degrees
a	106.99
b	106.43
c	74.42
d	72.15
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.10	42.40	-35.50	58.50	-18.80	42.20	-35.60	58.32	-19.20	42.60	-35.40	58.62
RMef-LMef	B	-45.40	-2.10	0.90	45.46	-45.60	-2.20	0.90	45.66	-45.50	-2.70	0.60	45.58
LMf-Lmef	C	13.80	42.90	-37.20	58.44	14.50	42.60	-37.50	58.58	14.50	42.60	-37.70	58.71
RMf-LMf	D	-78.30	-2.60	2.60	78.39	-78.90	-2.60	2.80	78.99	-79.20	-2.70	2.90	79.30
RMf-Lmef	E	-64.50	40.30	-34.60	83.56	-64.40	40.00	-34.70	83.38	-64.70	39.90	-34.80	83.60
LMf-Rmef	F	59.20	45.00	-38.10	83.55	60.10	44.80	-38.40	84.22	60.00	45.30	-38.30	84.37

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.86	106.29		1.85	105.96		1.85	106.02
b	BCF	1.86	106.40		1.87	107.15		1.87	107.34
c	CDE	1.29	73.66		1.27	72.91		1.27	72.85
d	ADF	1.28	73.62		1.29	73.95		1.29	73.72
Sum			359.98			359.97			359.93

T2 Average Angles		
Angles		Degrees
a		106.09
b		106.96
c		73.14
d		73.76
Sum		359.96

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.90
b	0.53
c	-1.28
d	1.61

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-16.97	-58.40	-12.73
Landmark 2	Lmef	24.43	-58.13	-11.03
Landmark 3	RMf	-39.83	-15.83	-56.60
Landmark 4	LMf	43.03	-13.80	-54.80

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.10	0.21
Landmark 2	Lmef	0.06	0.15	0.25
Landmark 3	RMf	0.06	0.12	0.44
Landmark 4	LMf	0.06	0.52	0.62

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.90	-58.50	-12.80	-17.10	-58.30	-12.90	-16.90	-58.40	-12.50
Landmark 2	Lmef	24.50	-58.10	-11.00	24.40	-58.00	-11.30	24.40	-58.30	-10.80
Landmark 3	RMf	-39.90	-15.70	-56.90	-39.80	-15.90	-56.80	-39.80	-15.90	-56.10
Landmark 4	LMf	43.00	-14.10	-54.30	43.10	-14.10	-54.60	43.00	-13.20	-55.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.40	-0.27	-1.70	41.44
RMf to LMf	-82.87	-2.03	-1.80	82.91
RMf to Rmef	-22.87	42.57	-43.87	65.26
LMf to Lmef	18.60	44.33	-43.77	65.01
RMf to Lmef	-64.27	42.30	-45.57	89.42
LMf to Rmef	60.00	44.60	-42.07	85.78

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.30	-63.77	-7.30
Landmark 2	Lmef	23.10	-64.30	-7.17
Landmark 3	RMf	-42.10	-17.93	-49.17
Landmark 4	LMf	41.03	-17.50	-50.87

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.00	0.06	0.17
Landmark 2	Lmef	0.10	0.20	0.06
Landmark 3	RMf	0.10	0.06	0.40
Landmark 4	LMf	0.25	0.17	0.58

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.30	-63.70	-7.20	-18.30	-63.80	-7.20	-18.30	-63.80	-7.50
Landmark 2	Lmef	23.10	-64.30	-7.20	23.00	-64.50	-7.20	23.20	-64.10	-7.10
Landmark 3	RMf	-42.10	-18.00	-48.80	-42.20	-17.90	-49.10	-42.00	-17.90	-49.60
Landmark 4	LMf	41.30	-17.40	-51.20	40.80	-17.40	-51.20	41.00	-17.70	-50.20

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.40	0.53	-0.13	41.40
RMf to LMf	-83.13	-0.43	1.70	83.15
RMf to Rmef	-23.80	45.83	-41.87	66.48
LMf to Lmef	17.93	46.80	-43.70	66.49
RMf to Lmef	-65.20	46.37	-42.00	90.36
LMf to Rmef	59.33	46.27	-43.57	86.94

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.03
RMf to LMf	0.24
RMf to Rmef	1.22
LMf to Lmef	1.48
RMf to Lmef	0.94
LMf to Rmef	1.16

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-23.00	42.80	-44.10	65.62	-22.70	42.40	-43.90	65.12	-22.90	42.50	-43.60	65.05
RMef-LMef	B	-41.40	-0.40	-1.80	41.44	-41.50	-0.30	-1.60	41.53	-41.30	-0.10	-1.70	41.34
LMf-Lmef	C	18.50	44.00	-43.30	64.44	18.70	43.90	-43.30	64.43	18.60	45.10	-44.70	66.17
RMf-LMf	D	-82.90	-1.60	-2.60	82.96	-82.90	-1.80	-2.20	82.95	-82.80	-2.70	-0.60	82.85
RMf-Lmef	E	-64.40	42.40	-45.90	89.73	-64.20	42.10	-45.50	89.24	-64.20	42.40	-45.30	89.28
LMf-Rmef	F	59.90	44.40	-41.50	85.33	60.20	44.20	-41.70	85.54	59.90	45.20	-43.00	86.49

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.90		1.95	111.69		1.96	112.19
b	BCF	1.84	105.32		1.84	105.61		1.83	104.76
c	CDE	1.29	73.80		1.28	73.32		1.27	72.65
d	ADF	1.20	68.98		1.21	69.38		1.23	70.40
Sum			360.00			360.00			360.00

T1 Average Angles	
Angles	Degrees
a	111.93
b	105.23
c	73.26
d	69.59
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-23.80	45.70	-41.60	66.22	-23.90	45.90	-41.90	66.59	-23.70	45.90	-42.10	66.64
RMef-LMef	B	-41.40	0.60	0.00	41.40	-41.30	0.70	0.00	41.31	-41.50	0.30	-0.40	41.50
LMf-Lmef	C	18.20	46.90	-44.00	66.83	17.80	47.10	-44.00	66.87	17.80	46.40	-43.10	65.78
RMf-LMf	D	-83.40	-0.60	2.40	83.44	-83.00	-0.50	2.10	83.03	-83.00	-0.20	0.60	83.00
RMf-Lmef	E	-65.20	46.30	-41.60	90.14	-65.20	46.60	-41.90	90.43	-65.20	46.20	-42.50	90.51
LMf-Rmef	F	59.60	46.30	-44.00	87.36	59.10	46.40	-44.00	87.07	59.30	46.10	-42.70	86.40

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.68		1.95	111.75		1.95	111.51
b	BCF	1.84	105.20		1.83	104.73		1.83	105.02
c	CDE	1.27	72.77		1.28	73.32		1.29	73.92
d	ADF	1.23	70.35		1.23	70.20		1.21	69.55
Sum			360.00			360.00			360.00

T2 Average Angles	
Angles	Degrees
a	111.65
b	104.98
c	73.34
d	70.03
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	**-0.28**
b	**-0.25**
c	**0.08**
d	**0.45**

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.27	-58.60	-18.27
Landmark 2	Lmef	19.43	-59.20	-16.83
Landmark 3	RMf	-38.00	-18.13	-53.57
Landmark 4	LMf	41.13	-18.93	-53.70

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.20	0.21
Landmark 2	Lmef	0.12	0.10	0.15
Landmark 3	RMf	0.20	0.38	0.25
Landmark 4	LMf	0.06	0.38	0.20

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-20.40	-58.40	-18.10		-20.10	-58.60	-18.20		-20.30	-58.80	-18.50
Landmark 2	Lmef	19.50	-59.10	-16.70		19.50	-59.20	-16.80		19.30	-59.30	-17.00
Landmark 3	RMf	-38.20	-18.30	-53.30		-37.80	-17.70	-53.60		-38.00	-18.40	-53.80
Landmark 4	LMf	41.10	-19.20	-53.50		41.20	-19.10	-53.90		41.10	-18.50	-53.70

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.70	0.60	-1.43	39.73
RMf to LMf	-79.13	0.80	0.13	79.14
RMf to Rmef	-17.73	40.47	-35.30	56.55
LMf to Lmef	21.70	40.27	-36.87	58.75
RMf to Lmef	-57.43	41.07	-36.73	79.59
LMf to Rmef	61.40	39.67	-35.43	81.23

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.27	-63.40	-18.67
Landmark 2	Lmef	19.30	-63.73	-19.30
Landmark 3	RMf	-40.80	-20.50	-52.60
Landmark 4	LMf	38.93	-20.53	-56.37

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.35	0.30	0.06
Landmark 2	Lmef	0.10	0.12	0.10
Landmark 3	RMf	0.10	0.10	0.10
Landmark 4	LMf	0.29	0.32	0.25

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-21.60	-63.10	-18.60		-20.90	-63.70	-18.70		-21.30	-63.40	-18.70
Landmark 2	Lmef	19.40	-63.80	-19.30		19.30	-63.60	-19.20		19.20	-63.80	-19.40
Landmark 3	RMf	-40.90	-20.60	-52.60		-40.80	-20.40	-52.70		-40.70	-20.50	-52.50
Landmark 4	LMf	39.10	-20.30	-56.60		39.10	-20.90	-56.10		38.60	-20.40	-56.40

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.57	0.33	0.63	40.57
RMf to LMf	-79.73	0.03	3.77	79.82
RMf to Rmef	-19.53	42.90	-33.93	58.08
LMf to Lmef	19.63	43.20	-37.07	60.21
RMf to Lmef	-60.10	43.23	-33.30	81.18
LMf to Rmef	60.20	42.87	-37.70	82.96

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.84
RMf to LMf	0.68
RMf to Rmef	1.53
LMf to Lmef	1.46
RMf to Lmef	1.59
LMf to Rmef	1.73

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.80	40.10	-35.20	56.25	-17.70	40.90	-35.40	56.91	-17.70	40.40	-35.30	56.49
RMef-LMef	B	-39.90	0.70	-1.40	39.93	-39.60	0.60	-1.40	39.63	-39.60	0.50	-1.50	39.63
LMf-Lmef	C	21.60	39.90	-36.80	58.42	21.70	40.10	-37.10	58.78	21.80	40.80	-36.70	59.05
RMf-LMf	D	-79.30	0.90	0.20	79.31	-79.00	1.40	0.30	79.01	-79.10	0.10	-0.10	79.10
RMf-Lmef	E	-57.70	40.80	-36.60	79.58	-57.30	41.50	-36.80	79.75	-57.30	40.90	-36.80	79.44
LMf-Rmef	F	61.50	39.20	-35.40	81.07	61.30	39.50	-35.70	81.19	61.40	40.30	-35.20	81.44

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.93	110.53		1.92	110.10		1.92	110.23
b	BCF	1.91	109.60		1.91	109.65		1.91	109.67
c	CDE	1.20	68.68		1.20	68.94		1.19	68.44
d	ADF	1.24	71.16		1.24	71.26		1.25	71.64
Sum			359.96			359.94			359.98

T1 Average Angles	
Angles	Degrees
a	110.28
b	109.64
c	68.68
d	71.35
Sum	359.96

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.30	42.50	-34.00	57.75	-19.90	43.30	-34.00	58.54	-19.40	42.90	-33.80	57.96
RMef-LMef	B	-41.00	0.70	0.70	41.01	-40.20	-0.10	0.50	40.20	-40.50	0.40	0.70	40.51
LMf-Lmef	C	19.70	43.50	-37.30	60.59	19.80	42.70	-36.90	59.81	19.40	43.40	-37.00	60.24
RMf-LMf	D	-80.00	-0.30	4.00	80.10	-79.90	0.50	3.40	79.97	-79.30	-0.10	3.90	79.40
RMf-Lmef	E	-60.30	43.20	-33.30	81.31	-60.10	43.20	-33.50	81.24	-59.90	43.30	-33.10	80.98
LMf-Rmef	F	60.70	42.80	-38.00	83.43	60.00	42.80	-37.40	82.65	59.90	43.00	-37.70	82.81

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.67		1.91	109.32		1.91	109.38
b	BCF	1.90	108.86		1.92	109.91		1.90	108.99
c	CDE	1.20	69.01		1.21	69.36		1.21	69.35
d	ADF	1.26	72.44		1.25	71.36		1.26	72.26
Sum			359.99			359.95			359.98

T2 Average Angles	
Angles	Degrees
a	109.46
b	109.25
c	69.24
d	72.02
Sum	359.97

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	**-0.83**
b	**-0.39**
c	**0.55**
d	**0.67**

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-23.80	-55.70	-1.33
Landmark 2	Lmef	23.10	-55.47	1.37
Landmark 3	RMf	-36.93	-18.30	-48.93
Landmark 4	LMf	39.87	-16.73	-48.73

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.26	0.17	0.06
Landmark 2	Lmef	0.20	0.21	0.06
Landmark 3	RMf	0.31	0.26	0.25
Landmark 4	LMf	0.21	0.15	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.70	-55.80	-1.40	-23.60	-55.80	-1.30	-24.10	-55.50	-1.30
Landmark 2	Lmef	23.10	-55.70	1.30	23.30	-55.30	1.40	22.90	-55.40	1.40
Landmark 3	RMf	-37.20	-18.10	-49.20	-36.60	-18.60	-48.90	-37.00	-18.20	-48.70
Landmark 4	LMf	39.70	-16.70	-48.60	39.80	-16.90	-48.80	40.10	-16.60	-48.80

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.90	-0.23	-2.70	46.98
RMf to LMf	-76.80	-1.57	-0.20	76.82
RMf to Rmef	-13.13	37.40	-47.60	61.94
LMf to Lmef	16.77	38.73	-50.10	65.51
RMf to Lmef	-60.03	37.17	-50.30	86.69
LMf to Rmef	63.67	38.97	-47.40	88.42

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-25.10	-59.67	0.27
Landmark 2	Lmef	21.60	-60.53	-1.73
Landmark 3	RMf	-42.00	-19.60	-44.83
Landmark 4	LMf	34.83	-19.57	-50.87

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.00	0.06	0.21
Landmark 2	Lmef	0.26	0.38	0.23
Landmark 3	RMf	0.26	0.26	0.35
Landmark 4	LMf	0.21	0.31	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-25.10	-59.70	0.10	-25.10	-59.70	0.20	-25.10	-59.60	0.50
Landmark 2	Lmef	21.50	-60.70	-1.60	21.90	-60.10	-1.60	21.40	-60.80	-2.00
Landmark 3	RMf	-42.30	-19.30	-45.20	-41.90	-19.80	-44.50	-41.80	-19.70	-44.80
Landmark 4	LMf	34.60	-19.90	-50.70	34.90	-19.30	-51.10	35.00	-19.50	-50.80

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.70	0.87	2.00	46.75
RMf to LMf	-76.83	-0.03	6.03	77.07
RMf to Rmef	-16.90	40.07	-45.10	62.65
LMf to Lmef	13.23	40.97	-49.13	65.33
RMf to Lmef	-63.60	40.93	-43.10	87.05
LMf to Rmef	59.93	40.10	-51.13	88.40

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.23
RMf to LMf	0.25
RMf to Rmef	0.71
LMf to Lmef	-0.18
RMf to Lmef	0.36
LMf to Rmef	-0.02

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-13.50	37.70	-47.80	62.36	-13.00	37.20	-47.60	61.79	-12.90	37.30	-47.40	61.68
RMef-LMef	B	-46.80	-0.10	-2.70	46.88	-46.90	-0.50	-2.70	46.98	-47.00	-0.10	-2.70	47.08
LMf-Lmef	C	16.60	39.00	-49.90	65.47	16.50	38.40	-50.20	65.32	17.20	38.80	-50.20	65.74
RMf-LMf	D	-76.90	-1.40	-0.60	76.92	-76.40	-1.70	-0.10	76.42	-77.10	-1.60	0.10	77.12
RMf-Lmef	E	-60.30	37.60	-50.50	87.18	-59.90	36.70	-50.30	86.40	-59.90	37.20	-50.10	86.50
LMf-Rmef	F	63.40	39.10	-47.20	88.18	63.40	38.90	-47.50	88.26	64.20	38.90	-47.50	88.83

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.83	105.01	1.82	104.35	1.83	104.57
b	BCF	1.78	102.15	1.79	102.37	1.79	102.63
c	CDE	1.31	75.03	1.30	74.66	1.29	74.05
d	ADF	1.36	77.79	1.37	78.58	1.37	78.72
Sum			359.98		359.96		359.97

T1 Average Angles	
Angles	Degrees
a	104.64
b	102.38
c	74.58
d	78.37
Sum	359.97

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.20	40.40	-45.30	63.09	-16.80	39.90	-44.70	62.23	-16.70	39.90	-45.30	62.63
RMef-LMef	B	-46.60	1.00	1.70	46.64	-47.00	0.40	1.80	47.04	-46.50	1.20	2.50	46.58
LMf-Lmef	C	13.10	40.80	-49.10	65.17	13.00	40.80	-49.50	65.45	13.60	41.30	-48.80	65.36
RMf-LMf	D	-76.90	0.60	5.50	77.10	-76.80	-0.50	6.60	77.08	-76.80	-0.20	6.00	77.03
RMf-Lmef	E	-63.80	41.40	-43.60	87.67	-63.80	40.30	-42.90	86.80	-63.20	41.10	-42.80	86.69
LMf-Rmef	F	59.70	39.80	-50.80	87.91	60.00	40.40	-51.30	88.68	60.10	40.10	-51.30	88.61

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.83	105.07		1.82	104.34		1.82	104.11
b	BCF	1.79	102.41		1.79	102.83		1.80	103.39
c	CDE	1.32	75.56		1.30	74.53		1.30	74.50
d	ADF	1.34	76.96		1.37	78.27		1.36	78.00
Sum			359.99			359.98			360.00

T2 Average Angles		
Angles		Degrees
a		104.51
b		102.88
c		74.86
d		77.74
Sum		359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.14
b	0.49
c	0.29
d	-0.62

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.77	-58.70	-11.07
Landmark 2	Lmef	29.53	-57.93	-9.97
Landmark 3	RMf	-36.63	-18.70	-50.57
Landmark 4	LMf	41.47	-15.33	-50.60

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.00	0.21
Landmark 2	Lmef	0.12	0.06	0.15
Landmark 3	RMf	0.32	0.30	0.15
Landmark 4	LMf	0.12	0.12	0.30

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-19.60	-58.70	-11.30		-19.80	-58.70	-11.00		-19.90	-58.70	-10.90
Landmark 2	Lmef	29.60	-57.90	-9.80		29.40	-58.00	-10.00		29.60	-57.90	-10.10
Landmark 3	RMf	-36.40	-18.40	-50.70		-36.50	-19.00	-50.60		-37.00	-18.70	-50.40
Landmark 4	LMf	41.40	-15.40	-50.90		41.40	-15.40	-50.60		41.60	-15.20	-50.30

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-49.30	-0.77	-1.10	49.32
RMf to LMf	-78.10	-3.37	0.03	78.17
RMf to Rmef	-16.87	40.00	-39.50	58.69
LMf to Lmef	11.93	42.60	-40.63	60.07
RMf to Lmef	-66.17	39.23	-40.60	86.98
LMf to Rmef	61.23	43.37	-39.53	84.81

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.20	-67.47	-10.47
Landmark 2	Lmef	31.07	-67.37	-9.40
Landmark 3	RMf	-36.97	-22.67	-49.43
Landmark 4	LMf	44.27	-18.27	-49.57

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.06	0.15
Landmark 2	Lmef	0.06	0.06	0.10
Landmark 3	RMf	0.49	0.51	0.06
Landmark 4	LMf	0.21	0.40	0.12

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-19.10	-67.40	-10.60		-19.30	-67.50	-10.30		-19.20	-67.50	-10.50
Landmark 2	Lmef	31.10	-67.30	-9.30		31.10	-67.40	-9.40		31.00	-67.40	-9.50
Landmark 3	RMf	-36.40	-23.10	-49.40		-37.30	-22.10	-49.50		-37.20	-22.80	-49.40
Landmark 4	LMf	44.20	-17.80	-49.70		44.50	-18.50	-49.50		44.10	-18.50	-49.50

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-50.27	-0.10	-1.07	50.28
RMf to LMf	-81.23	-4.40	0.13	81.35
RMf to Rmef	-17.77	44.80	-38.97	61.98
LMf to Lmef	13.20	49.10	-40.17	64.80
RMf to Lmef	-68.03	44.70	-40.03	90.72
LMf to Rmef	63.47	49.20	-39.10	89.32

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.96
RMf to LMf	3.18
RMf to Rmef	3.28
LMf to Lmef	4.73
RMf to Lmef	3.73
LMf to Rmef	4.50

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.80	40.30	-39.40	58.81	-16.70	39.70	-39.60	58.51	-17.10	40.00	-39.50	58.76
RMef-LMef	B	-49.20	-0.80	-1.50	49.23	-49.20	-0.70	-1.00	49.22	-49.50	-0.80	-0.80	49.51
LMf-Lmef	C	11.80	42.50	-41.10	60.29	12.00	42.60	-40.60	60.06	12.00	42.70	-40.20	59.86
RMf-LMf	D	-77.80	-3.00	0.20	77.86	-77.90	-3.60	0.00	77.98	-78.60	-3.50	-0.10	78.68
RMf-Lmef	E	-66.00	39.50	-40.90	87.12	-65.90	39.00	-40.60	86.67	-66.60	39.20	-40.30	87.16
LMf-Rmef	F	61.00	43.30	-39.60	84.64	61.20	43.30	-39.60	84.78	61.50	43.50	-39.40	85.01

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.14	1.86	106.82	1.87	106.91
b	BCF	1.76	100.74	1.77	101.31	1.77	101.60
c	CDE	1.34	77.03	1.34	76.57	1.34	76.64
d	ADF	1.31	75.09	1.31	75.30	1.31	74.85
Sum			**360.00**		**360.00**		**359.99**

T1 Average Angles	
Angles	Degrees
a	106.96
b	101.22
c	76.74
d	75.08
Sum	**360.00**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.30	44.30	-38.80	61.38	-18.00	45.40	-39.20	62.62	-18.00	44.70	-38.90	61.93
RMef-LMef	B	-50.20	-0.10	-1.30	50.22	-50.40	-0.10	-0.90	50.41	-50.20	-0.10	-1.00	50.21
LMf-Lmef	C	13.10	49.50	-40.40	65.22	13.40	48.90	-40.10	64.64	13.10	48.90	-40.00	64.52
RMf-LMf	D	-80.60	-5.30	0.30	80.77	-81.80	-3.60	0.00	81.88	-81.30	-4.30	0.10	81.41
RMf-Lmef	E	-67.50	44.20	-40.10	90.10	-68.40	45.30	-40.10	91.32	-68.20	44.60	-39.90	90.73
LMf-Rmef	F	63.30	49.60	-39.10	89.42	63.80	49.00	-39.20	89.49	63.30	49.00	-39.00	89.04

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.26		1.87	107.28		1.88	107.56
b	BCF	1.76	100.73		1.77	101.40		1.76	101.08
c	CDE	1.32	75.37		1.33	76.09		1.32	75.90
d	ADF	1.34	76.61		1.31	75.21		1.32	75.44
Sum			359.98			359.99			359.98

T2 Average Angles		
Angles		Degrees
a		107.37
b		101.07
c		75.79
d		75.75
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.41
b	-0.14
c	-0.95
d	0.68

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.63	-39.33	-9.50
Landmark 2	Lmef	21.10	-38.80	-9.43
Landmark 3	RMf	-43.17	-15.00	-52.40
Landmark 4	LMf	43.00	-10.57	-52.07

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.15	0.20
Landmark 2	Lmef	0.20	0.30	0.23
Landmark 3	RMf	0.15	0.20	0.17
Landmark 4	LMf	0.10	0.23	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.70	-39.50	-9.50	-21.50	-39.20	-9.30	-21.70	-39.30	-9.70
Landmark 2	Lmef	21.30	-38.50	-9.30	21.10	-38.80	-9.70	20.90	-39.10	-9.30
Landmark 3	RMf	-43.20	-14.80	-52.20	-43.30	-15.00	-52.50	-43.00	-15.20	-52.50
Landmark 4	LMf	43.00	-10.70	-51.90	42.90	-10.30	-52.30	43.10	-10.70	-52.00

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.73	-0.53	-0.07	42.74
RMf to LMf	-86.17	-4.43	-0.33	86.28
RMf to Rmef	-21.53	24.33	-42.90	53.82
LMf to Lmef	21.90	28.23	-42.63	55.63
RMf to Lmef	-64.27	23.80	-42.97	80.89
LMf to Rmef	64.63	28.77	-42.57	82.56

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.83	-49.93	-8.10
Landmark 2	Lmef	20.70	-48.80	-9.47
Landmark 3	RMf	-47.53	-20.97	-52.97
Landmark 4	LMf	43.00	-15.83	-55.43

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.47	0.10
Landmark 2	Lmef	0.17	0.56	0.12
Landmark 3	RMf	0.38	0.32	0.21
Landmark 4	LMf	0.00	0.12	0.38

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.70	-50.30	-8.00	-21.80	-50.10	-8.10	-22.00	-49.40	-8.20
Landmark 2	Lmef	20.60	-48.70	-9.40	20.90	-48.30	-9.60	20.60	-49.40	-9.40
Landmark 3	RMf	-47.70	-20.60	-52.90	-47.10	-21.20	-52.80	-47.80	-21.10	-53.20
Landmark 4	LMf	43.00	-15.90	-55.00	43.00	-15.70	-55.70	43.00	-15.90	-55.60

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.53	-1.13	1.37	42.57
RMf to LMf	-90.53	-5.13	2.47	90.71
RMf to Rmef	-25.70	28.97	-44.87	59.27
LMf to Lmef	22.30	32.97	-45.97	60.80
RMf to Lmef	-68.23	27.83	-43.50	85.57
LMf to Rmef	64.83	34.10	-47.33	87.22

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.17
RMf to LMf	4.43
RMf to Rmef	5.45
LMf to Lmef	5.18
RMf to Lmef	4.69
LMf to Rmef	4.65

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.50	24.70	-42.70	53.81	-21.80	24.20	-43.20	54.10	-21.30	24.10	-42.80	53.54
RMef-LMef	B	-43.00	-1.00	-0.20	43.01	-42.60	-0.40	0.40	42.60	-42.60	-0.20	-0.40	42.60
LMf-Lmef	C	21.70	27.80	-42.60	55.30	21.80	28.50	-42.60	55.70	22.20	28.40	-42.70	55.88
RMf-LMf	D	-86.20	-4.10	-0.30	86.30	-86.20	-4.70	-0.20	86.33	-86.10	-4.50	-0.50	86.22
RMf-Lmef	E	-64.50	23.70	-42.90	81.01	-64.40	23.80	-42.80	80.91	-63.90	23.90	-43.20	80.75
LMf-Rmef	F	64.70	28.80	-42.40	82.54	64.40	28.90	-43.00	82.65	64.80	28.60	-42.30	82.50

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.97	113.11	1.97	113.03	1.99	113.78
b	BCF	1.98	113.60	1.99	113.79	1.97	113.11
c	CDE	1.14	65.60	1.14	65.36	1.14	65.24
d	ADF	1.18	67.66	1.18	67.68	1.18	67.76
Sum			**359.97**		**359.85**		**359.89**

T1 Average Angles	
Angles	Degrees
a	113.31
b	113.50
c	65.40
d	67.70
Sum	**359.90**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-26.00	29.70	-44.90	59.78	-25.30	28.90	-44.70	58.94	-25.80	28.30	-45.00	59.09
RMef-LMef	B	-42.30	-1.60	1.40	42.35	-42.70	-1.80	1.50	42.76	-42.60	0.00	1.20	42.62
LMf-Lmef	C	22.40	32.80	-45.60	60.47	22.10	32.60	-46.10	60.63	22.40	33.50	-46.20	61.31
RMf-LMf	D	-90.70	-4.70	2.10	90.85	-90.10	-5.50	2.90	90.31	-90.80	-5.20	2.40	90.98
RMf-Lmef	E	-68.30	28.10	-43.50	85.71	-68.00	27.10	-43.20	85.00	-68.40	28.30	-43.80	86.01
LMf-Rmef	F	64.70	34.40	-47.00	87.05	64.80	34.40	-47.60	87.45	65.00	33.50	-47.40	87.14

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.97	113.00		1.96	112.42		2.00	114.52
b	BCF	2.00	114.54		2.00	114.41		1.97	112.73
c	CDE	1.14	65.46		1.14	65.12		1.14	65.43
d	ADF	1.17	66.97		1.19	68.03		1.17	67.15
Sum			359.98			359.98			359.84

T2 Average Angles		
Angles		Degrees
a		113.31
b		113.89
c		65.34
d		67.39
Sum		359.93

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.01
b	0.40
c	-0.06
d	-0.31

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.40	-46.30	-11.43
Landmark 2	Lmef	22.30	-43.40	-10.37
Landmark 3	RMf	-35.90	-19.13	-53.87
Landmark 4	LMf	39.27	-16.27	-53.77

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.17	0.10	0.15
Landmark 2	Lmef	0.00	0.00	0.12
Landmark 3	RMf	0.17	0.12	0.06
Landmark 4	LMf	0.15	0.06	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.60	-46.20	-11.30	-19.30	-46.30	-11.40	-19.30	-46.40	-11.60
Landmark 2	Lmef	22.30	-43.40	-10.30	22.30	-43.40	-10.30	22.30	-43.40	-10.50
Landmark 3	RMf	-36.00	-19.20	-53.90	-35.70	-19.00	-53.90	-36.00	-19.20	-53.80
Landmark 4	LMf	39.30	-16.30	-54.00	39.10	-16.20	-53.60	39.40	-16.30	-53.70

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.70	-2.90	-1.07	41.81
RMf to LMf	-75.17	-2.87	-0.10	75.22
RMf to Rmef	-16.50	27.17	-42.43	53.02
LMf to Lmef	16.97	27.13	-43.40	53.92
RMf to Lmef	-58.20	24.27	-43.50	76.61
LMf to Rmef	58.67	30.03	-42.33	78.33

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.13	-55.00	-9.77
Landmark 2	Lmef	21.57	-50.67	-7.93
Landmark 3	RMf	-38.77	-26.07	-55.20
Landmark 4	LMf	39.73	-21.50	-54.70

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.17	0.12
Landmark 2	Lmef	0.12	0.06	0.06
Landmark 3	RMf	0.12	0.12	0.10
Landmark 4	LMf	0.06	0.10	0.00

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.10	-54.90	-9.70	-21.20	-54.90	-9.90	-21.10	-55.20	-9.70
Landmark 2	Lmef	21.50	-50.70	-7.90	21.50	-50.70	-8.00	21.70	-50.60	-7.90
Landmark 3	RMf	-38.70	-26.00	-55.30	-38.70	-26.20	-55.10	-38.90	-26.00	-55.20
Landmark 4	LMf	39.80	-21.50	-54.70	39.70	-21.60	-54.70	39.70	-21.40	-54.70

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.70	-4.33	-1.83	42.96
RMf to LMf	-78.50	-4.57	-0.50	78.63
RMf to Rmef	-17.63	28.93	-45.43	56.68
LMf to Lmef	18.17	29.17	-46.77	58.03
RMf to Lmef	-60.33	24.60	-47.27	80.49
LMf to Rmef	60.87	33.50	-44.93	82.74

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.14
RMf to LMf	3.41
RMf to Rmef	3.66
LMf to Lmef	4.11
RMf to Lmef	3.89
LMf to Rmef	4.41

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.40	27.00	-42.60	53.04	-16.40	27.30	-42.50	53.11	-16.70	27.20	-42.20	52.91
RMef-LMef	B	-41.90	-2.80	-1.00	42.01	-41.60	-2.90	-1.10	41.72	-41.60	-3.00	-1.10	41.72
LMf-Lmef	C	17.00	27.10	-43.70	54.16	16.80	27.20	-43.30	53.82	17.10	27.10	-43.20	53.79
RMf-LMf	D	-75.30	-2.90	0.10	75.36	-74.80	-2.80	-0.30	74.85	-75.40	-2.90	-0.10	75.46
RMf-Lmef	E	-58.30	24.20	-43.60	76.72	-58.00	24.40	-43.60	76.55	-58.30	24.20	-43.30	76.55
LMf-Rmef	F	58.90	29.90	-42.70	78.65	58.40	30.10	-42.20	78.09	58.70	30.10	-42.10	78.26

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.08	1.87	107.06	1.87	107.38
b	BCF	1.90	109.10	1.90	108.98	1.91	109.39
c	CDE	1.23	70.49	1.24	70.88	1.23	70.37
d	ADF	1.28	73.24	1.27	72.99	1.27	72.74
Sum			**359.91**		**359.90**		**359.88**

T1 Average Angles	
Angles	Degrees
a	107.17
b	109.16
c	70.58
d	72.99
Sum	**359.90**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.60	28.90	-45.60	56.78	-17.50	28.70	-45.20	56.33	-17.80	29.20	-45.50	56.92
RMef-LMef	B	-42.60	-4.20	-1.80	42.84	-42.70	-4.20	-1.90	42.95	-42.80	-4.60	-1.80	43.08
LMf-Lmef	C	18.30	29.20	-46.80	58.12	18.20	29.10	-46.70	57.96	18.00	29.20	-46.80	58.02
RMf-LMf	D	-78.50	-4.50	-0.60	78.63	-78.40	-4.60	-0.40	78.54	-78.60	-4.60	-0.50	78.74
RMf-Lmef	E	-60.20	24.70	-47.40	80.50	-60.20	24.50	-47.10	80.27	-60.60	24.60	-47.30	80.71
LMf-Rmef	F	60.90	33.40	-45.00	82.76	60.90	33.30	-44.80	82.61	60.80	33.80	-45.00	82.85

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	106.98		1.87	107.13		1.86	106.82
b	BCF	1.91	109.18		1.90	109.01		1.91	109.16
c	CDE	1.23	70.31		1.23	70.20		1.23	70.49
d	ADF	1.28	73.36		1.28	73.48		1.28	73.30
Sum			359.82			359.81			359.77

T2 Average Angles	
Angles	Degrees
a	106.98
b	109.11
c	70.33
d	73.38
Sum	359.80

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.20
b	-0.04
c	-0.25
d	0.39

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-24.40	-49.47	-6.13
Landmark 2	Lmef	19.00	-48.70	-3.90
Landmark 3	RMf	-40.47	-16.43	-45.60
Landmark 4	LMf	40.23	-16.20	-43.47

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.15	0.06
Landmark 2	Lmef	0.00	0.00	0.10
Landmark 3	RMf	0.21	0.21	0.17
Landmark 4	LMf	0.15	0.26	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-24.50	-49.30	-6.10	-24.30	-49.50	-6.10	-24.40	-49.60	-6.20
Landmark 2	Lmef	19.00	-48.70	-4.00	19.00	-48.70	-3.90	19.00	-48.70	-3.80
Landmark 3	RMf	-40.30	-16.60	-45.70	-40.40	-16.50	-45.40	-40.70	-16.20	-45.70
Landmark 4	LMf	40.10	-16.30	-43.40	40.40	-15.90	-43.50	40.20	-16.40	-43.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-43.40	-0.77	-2.23	43.46
RMf to LMf	-80.70	-0.23	-2.13	80.73
RMf to Rmef	-16.07	33.03	-39.47	53.92
LMf to Lmef	21.23	32.50	-39.57	55.43
RMf to Lmef	-59.47	32.27	-41.70	79.48
LMf to Rmef	64.63	33.27	-37.33	81.72

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-22.40	-55.20	-5.50
Landmark 2	Lmef	21.77	-55.17	-3.77
Landmark 3	RMf	-39.93	-17.20	-45.73
Landmark 4	LMf	44.00	-12.57	-45.20

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.00	0.10
Landmark 2	Lmef	0.25	0.12	0.15
Landmark 3	RMf	0.06	0.26	0.31
Landmark 4	LMf	0.26	0.21	0.35

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-22.40	-55.20	-5.60	-22.50	-55.20	-5.50	-22.30	-55.20	-5.40
Landmark 2	Lmef	21.80	-55.30	-3.60	21.50	-55.10	-3.90	22.00	-55.10	-3.80
Landmark 3	RMf	-40.00	-17.30	-45.40	-39.90	-16.90	-46.00	-39.90	-17.40	-45.80
Landmark 4	LMf	44.10	-12.50	-44.80	44.20	-12.40	-45.40	43.70	-12.80	-45.40

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-44.17	-0.03	-1.73	44.20
RMf to LMf	-83.93	-4.63	-0.53	84.06
RMf to Rmef	-17.53	38.00	-40.23	58.05
LMf to Lmef	22.23	42.60	-41.43	63.45
RMf to Lmef	-61.70	37.97	-41.97	83.72
LMf to Rmef	66.40	42.63	-39.70	88.33

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.74
RMf to LMf	3.33
RMf to Rmef	4.14
LMf to Lmef	8.02
RMf to Lmef	4.25
LMf to Rmef	6.61

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-15.80	32.70	-39.60	53.73	-16.10	33.00	-39.30	53.78	-16.30	33.40	-39.50	54.24
RMef-LMef	B	-43.50	-0.60	-2.10	43.55	-43.30	-0.80	-2.20	43.36	-43.40	-0.90	-2.40	43.48
LMf-Lmef	C	21.10	32.40	-39.40	55.20	21.40	32.80	-39.60	55.70	21.20	32.30	-39.70	55.40
RMf-LMf	D	-80.40	-0.30	-2.30	80.43	-80.80	-0.60	-1.90	80.82	-80.90	0.20	-2.20	80.93
RMf-Lmef	E	-59.30	32.10	-41.70	79.28	-59.40	32.20	-41.50	79.29	-59.70	32.50	-41.90	79.85
LMf-Rmef	F	64.60	33.00	-37.30	81.57	64.70	33.60	-37.40	81.94	64.60	33.20	-37.30	81.65

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.90	108.71	1.90	108.95	1.90	109.12
b	BCF	1.93	110.82	1.94	111.01	1.93	110.77
c	CDE	1.20	68.66	1.19	68.17	1.20	68.80
d	ADF	1.25	71.78	1.25	71.83	1.24	71.23
Sum			**359.97**		**359.95**		**359.91**

T1 Average Angles	
Angles	Degrees
a	108.92
b	110.86
c	68.55
d	71.61
Sum	**359.95**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.60	37.90	-39.80	57.71	-17.40	38.30	-40.50	58.39	-17.60	37.80	-40.40	58.06
RMef-LMef	B	-44.20	0.10	-2.00	44.25	-44.00	-0.10	-1.60	44.03	-44.30	-0.10	-1.60	44.33
LMf-Lmef	C	22.30	42.80	-41.20	63.46	22.70	42.70	-41.50	63.72	21.70	42.30	-41.60	63.17
RMf-LMf	D	-84.10	-4.80	-0.60	84.24	-84.10	-4.50	-0.60	84.22	-83.60	-4.60	-0.40	83.73
RMf-Lmef	E	-61.80	38.00	-41.80	83.73	-61.40	38.20	-42.10	83.68	-61.90	37.70	-42.00	83.77
LMf-Rmef	F	66.50	42.70	-39.20	88.22	66.70	42.80	-39.90	88.73	66.00	42.40	-40.00	88.06

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.71		1.90	108.75		1.90	109.06
b	BCF	1.90	108.67		1.91	109.50		1.90	108.72
c	CDE	1.18	67.38		1.17	67.24		1.18	67.88
d	ADF	1.30	74.22		1.30	74.49		1.30	74.32
Sum			359.99			359.98			359.98

T2 Average Angles		
Angles		Degrees
a		109.18
b		108.97
c		67.50
d		74.34
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.25
b	-1.90
c	-1.05
d	2.73

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.73	-59.87	-5.43
Landmark 2	Lmef	19.87	-60.53	-4.27
Landmark 3	RMf	-36.50	-21.47	-42.97
Landmark 4	LMf	38.17	-20.13	-43.23

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.23	0.21	0.23
Landmark 2	Lmef	0.15	0.15	0.15
Landmark 3	RMf	0.10	0.29	0.42
Landmark 4	LMf	0.55	0.38	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.60	-59.80	-5.30	-20.00	-59.70	-5.30	-19.60	-60.10	-5.70
Landmark 2	Lmef	19.70	-60.70	-4.30	19.90	-60.40	-4.10	20.00	-60.50	-4.40
Landmark 3	RMf	-36.40	-21.30	-43.30	-36.50	-21.30	-43.10	-36.60	-21.80	-42.50
Landmark 4	LMf	37.60	-20.30	-43.20	38.70	-20.40	-43.40	38.20	-19.70	-43.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.60	0.67	-1.17	39.62
RMf to LMf	-74.67	-1.33	0.27	74.68
RMf to Rmef	-16.77	38.40	-37.53	56.25
LMf to Lmef	18.30	40.40	-38.97	59.04
RMf to Lmef	-56.37	39.07	-38.70	78.75
LMf to Rmef	57.90	39.73	-37.80	79.75

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.10	-65.47	-1.67
Landmark 2	Lmef	20.50	-65.67	-1.07
Landmark 3	RMf	-36.70	-26.73	-38.40
Landmark 4	LMf	38.53	-24.80	-39.17

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.17	0.15	0.12
Landmark 2	Lmef	0.10	0.15	0.12
Landmark 3	RMf	0.10	0.70	0.10
Landmark 4	LMf	0.23	0.60	0.32

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.00	-65.30	-1.60	-19.30	-65.50	-1.60	-19.00	-65.60	-1.80
Landmark 2	Lmef	20.60	-65.50	-1.00	20.50	-65.70	-1.00	20.40	-65.80	-1.20
Landmark 3	RMf	-36.80	-26.80	-38.40	-36.60	-26.00	-38.30	-36.70	-27.40	-38.50
Landmark 4	LMf	38.40	-24.80	-39.40	38.80	-24.20	-39.30	38.40	-25.40	-38.80

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.60	0.20	-0.60	39.61
RMf to LMf	-75.23	-1.93	0.77	75.26
RMf to Rmef	-17.60	38.73	-36.73	56.21
LMf to Lmef	18.03	40.87	-38.10	58.71
RMf to Lmef	-57.20	38.93	-37.33	78.62
LMf to Rmef	57.63	40.67	-37.50	79.89

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.02
RMf to LMf	0.58
RMf to Rmef	-0.05
LMf to Lmef	-0.33
RMf to Lmef	-0.13
LMf to Rmef	0.14

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.80	38.50	-38.00	56.64	-16.50	38.40	-37.80	56.35	-17.00	38.30	-36.80	55.77
RMef-LMef	B	-39.30	0.90	-1.00	39.32	-39.90	0.70	-1.20	39.92	-39.60	0.40	-1.30	39.62
LMf-Lmef	C	17.90	40.40	-38.90	58.87	18.80	40.00	-39.30	59.14	18.20	40.80	-38.70	59.11
RMf-LMf	D	-74.00	-1.00	-0.10	74.01	-75.20	-0.90	0.30	75.21	-74.80	-2.10	0.60	74.83
RMf-Lmef	E	-56.10	39.40	-39.00	78.87	-56.40	39.10	-39.00	78.94	-56.60	38.70	-38.10	78.44
LMf-Rmef	F	57.20	39.50	-37.90	79.17	58.70	39.30	-38.10	80.26	57.80	40.40	-37.40	79.82

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.91	109.21	1.90	108.95	1.91	109.47
b	BCF	1.85	105.75	1.86	106.61	1.85	106.22
c	CDE	1.25	71.80	1.24	70.82	1.23	70.58
d	ADF	1.28	73.24	1.28	73.62	1.29	73.73
Sum			**360.00**		**360.00**		**360.00**

T1 Average Angles	
Angles	Degrees
a	109.21
b	106.19
c	71.07
d	73.53
Sum	**360.00**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.80	38.50	-36.80	56.15	-17.30	39.50	-36.70	56.63	-17.70	38.20	-36.70	55.85
RMef-LMef	B	-39.60	0.20	-0.60	39.61	-39.80	0.20	-0.60	39.81	-39.40	0.20	-0.60	39.41
LMf-Lmef	C	17.80	40.70	-38.40	58.72	18.30	41.50	-38.30	59.36	18.00	40.40	-37.60	58.05
RMf-LMf	D	-75.20	-2.00	1.00	75.23	-75.40	-1.80	1.00	75.43	-75.10	-2.00	0.30	75.13
RMf-Lmef	E	-57.40	38.70	-37.40	78.68	-57.10	39.70	-37.30	78.92	-57.10	38.40	-37.30	78.27
LMf-Rmef	F	57.40	40.50	-37.80	79.77	58.10	41.30	-37.70	80.64	57.40	40.20	-37.00	79.25

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.29		1.90	108.59		1.91	109.29
b	BCF	1.86	106.84		1.87	107.16		1.87	107.26
c	CDE	1.23	70.72		1.23	70.53		1.23	70.67
d	ADF	1.28	73.15		1.29	73.73		1.27	72.78
Sum			360.00			360.00			360.00

T2 Average Angles	
Angles	Degrees
a	109.06
b	107.08
c	70.64
d	73.22
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.15
b	0.89
c	-0.43
d	-0.31

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.60	-45.93	-12.40
Landmark 2	Lmef	27.67	-46.03	-15.40
Landmark 3	RMf	-41.57	-15.90	-56.20
Landmark 4	LMf	41.40	-12.57	-61.97

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.20	0.15	0.10
Landmark 2	Lmef	0.23	0.32	0.10
Landmark 3	RMf	0.25	0.17	0.10
Landmark 4	LMf	0.20	0.55	0.15

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-17.40	-46.10	-12.40		-17.80	-45.90	-12.50		-17.60	-45.80	-12.30
Landmark 2	Lmef	27.80	-45.80	-15.40		27.80	-45.90	-15.50		27.40	-46.40	-15.30
Landmark 3	RMf	-41.60	-15.80	-56.20		-41.80	-16.10	-56.30		-41.30	-15.80	-56.10
Landmark 4	LMf	41.40	-12.00	-62.00		41.20	-13.10	-61.80		41.60	-12.60	-62.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-45.27	0.10	3.00	45.37
RMf to LMf	-82.97	-3.33	5.77	83.23
RMf to Rmef	-23.97	30.03	-43.80	58.27
LMf to Lmef	13.73	33.47	-46.57	58.97
RMf to Lmef	-69.23	30.13	-40.80	85.82
LMf to Rmef	59.00	33.37	-49.57	83.97

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.77	-49.43	-6.03
Landmark 2	Lmef	28.67	-49.97	-8.20
Landmark 3	RMf	-42.70	-15.33	-54.33
Landmark 4	LMf	44.57	-15.70	-57.00

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.06	0.06
Landmark 2	Lmef	0.32	0.29	0.10
Landmark 3	RMf	0.10	0.21	0.06
Landmark 4	LMf	0.32	0.40	0.10

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-17.90	-49.40	-6.10		-17.70	-49.40	-6.00		-17.70	-49.50	-6.00
Landmark 2	Lmef	28.80	-49.80	-8.20		28.30	-50.30	-8.10		28.90	-49.80	-8.30
Landmark 3	RMf	-42.60	-15.10	-54.30		-42.70	-15.40	-54.30		-42.80	-15.50	-54.40
Landmark 4	LMf	44.20	-16.10	-56.90		44.70	-15.70	-57.00		44.80	-15.30	-57.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.43	0.53	2.17	46.49
RMf to LMf	-87.27	0.37	2.67	87.31
RMf to Rmef	-24.93	34.10	-48.30	64.17
LMf to Lmef	15.90	34.27	-48.80	61.71
RMf to Lmef	-71.37	34.63	-46.13	91.77
LMf to Rmef	62.33	33.73	-50.97	87.30

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.12
RMf to LMf	4.07
RMf to Rmef	5.90
LMf to Lmef	2.75
RMf to Lmef	5.94
LMf to Rmef	3.33

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-24.20	30.30	-43.80	58.50	-24.00	29.80	-43.80	58.16	-23.70	30.00	-43.80	58.14
RMef-LMef	B	-45.20	-0.30	3.00	45.30	-45.60	0.00	3.00	45.70	-45.00	0.60	3.00	45.10
LMf-Lmef	C	13.60	33.80	-46.60	59.15	13.40	32.80	-46.30	58.30	14.20	33.80	-46.80	59.45
RMf-LMf	D	-83.00	-3.80	5.80	83.29	-83.00	-3.00	5.50	83.24	-82.90	-3.20	6.00	83.18
RMf-Lmef	E	-69.40	30.00	-40.80	85.91	-69.60	29.80	-40.80	86.00	-68.70	30.60	-40.80	85.56
LMf-Rmef	F	58.80	34.10	-49.60	84.15	59.00	32.80	-49.30	83.59	59.20	33.20	-49.80	84.18

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.94	111.08	1.94	111.24	1.94	111.31
b	BCF	1.86	106.58	1.86	106.35	1.86	106.45
c	CDE	1.26	71.94	1.26	72.43	1.25	71.54
d	ADF	1.23	70.34	1.22	69.92	1.23	70.60
Sum			**359.94**		**359.94**		**359.90**

T1 Average Angles	
Angles	Degrees
a	111.21
b	106.46
c	71.97
d	70.29
Sum	**359.93**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-24.70	34.30	-48.20	64.11	-25.00	34.00	-48.30	64.14	-25.10	34.00	-48.40	64.25
RMef-LMef	B	-46.70	0.40	2.10	46.75	-46.00	0.90	2.10	46.06	-46.60	0.30	2.30	46.66
LMf-Lmef	C	15.40	33.70	-48.70	61.19	16.40	34.60	-48.90	62.11	15.90	34.50	-48.80	61.84
RMf-LMf	D	-86.80	1.00	2.60	86.84	-87.40	0.30	2.70	87.44	-87.60	-0.20	2.70	87.64
RMf-Lmef	E	-71.40	34.70	-46.10	91.80	-71.00	34.90	-46.20	91.62	-71.70	34.30	-46.10	91.88
LMf-Rmef	F	62.10	33.30	-50.80	86.87	62.40	33.70	-51.00	87.35	62.50	34.20	-51.10	87.68

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.93	110.84		1.94	111.43		1.94	110.88
b	BCF	1.86	106.41		1.86	106.78		1.87	106.98
c	CDE	1.30	74.39		1.28	73.36		1.28	73.59
d	ADF	1.19	68.36		1.19	68.40		1.20	68.53
Sum			360.00			359.97			359.98

T2 Average Angles		
Angles		Degrees
a		111.05
b		106.72
c		73.78
d		68.43
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.17
b	0.27
c	1.81
d	-1.86

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.93	-44.80	-11.73
Landmark 2	Lmef	22.53	-45.33	-11.07
Landmark 3	RMf	-36.73	-17.13	-49.87
Landmark 4	LMf	38.67	-15.83	-52.03

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.10	0.12
Landmark 2	Lmef	0.12	0.06	0.12
Landmark 3	RMf	0.15	0.25	0.25
Landmark 4	LMf	0.29	0.49	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.90	-44.90	-11.80	-19.80	-44.80	-11.80	-20.10	-44.70	-11.60
Landmark 2	Lmef	22.60	-45.30	-11.00	22.40	-45.40	-11.20	22.60	-45.30	-11.00
Landmark 3	RMf	-36.60	-16.90	-49.60	-36.90	-17.10	-50.10	-36.70	-17.40	-49.90
Landmark 4	LMf	38.50	-16.40	-51.90	38.50	-15.60	-52.00	39.00	-15.50	-52.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.47	0.53	-0.67	42.48
RMf to LMf	-75.40	-1.30	2.17	75.44
RMf to Rmef	-16.80	27.67	-38.13	50.02
LMf to Lmef	16.13	29.50	-40.97	53.00
RMf to Lmef	-59.27	28.20	-38.80	76.24
LMf to Rmef	58.60	28.97	-40.30	76.79

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.40	-48.53	-7.43
Landmark 2	Lmef	21.93	-48.50	-6.23
Landmark 3	RMf	-38.37	-20.43	-46.60
Landmark 4	LMf	38.87	-18.23	-47.47

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.20	0.15	0.21
Landmark 2	Lmef	0.23	0.10	0.06
Landmark 3	RMf	0.29	0.23	0.20
Landmark 4	LMf	0.25	0.15	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.40	-48.50	-7.50	-20.20	-48.70	-7.60	-20.60	-48.40	-7.20
Landmark 2	Lmef	22.20	-48.40	-6.20	21.80	-48.60	-6.20	21.80	-48.50	-6.30
Landmark 3	RMf	-38.20	-20.30	-46.60	-38.20	-20.70	-46.40	-38.70	-20.30	-46.80
Landmark 4	LMf	39.10	-18.10	-47.40	38.60	-18.20	-47.60	38.90	-18.40	-47.40

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.33	-0.03	-1.20	42.35
RMf to LMf	-77.23	-2.20	0.87	77.27
RMf to Rmef	-17.97	28.10	-39.17	51.44
LMf to Lmef	16.93	30.27	-41.23	53.88
RMf to Lmef	-60.30	28.07	-40.37	77.80
LMf to Rmef	59.27	30.30	-40.03	77.67

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.12
RMf to LMf	1.83
RMf to Rmef	1.43
LMf to Lmef	0.88
RMf to Lmef	1.56
LMf to Rmef	0.88

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.70	28.00	-37.80	49.92	-17.10	27.70	-38.30	50.27	-16.60	27.30	-38.30	49.88
RMef-LMef	B	-42.50	0.40	-0.80	42.51	-42.20	0.60	-0.60	42.21	-42.70	0.60	-0.60	42.71
LMf-Lmef	C	15.90	28.90	-40.90	52.54	16.10	29.80	-40.80	53.03	16.40	29.80	-41.20	53.43
RMf-LMf	D	-75.10	-0.50	2.30	75.14	-75.40	-1.50	1.90	75.44	-75.70	-1.90	2.30	75.76
RMf-Lmef	E	-59.20	28.40	-38.60	76.17	-59.30	28.30	-38.90	76.36	-59.30	27.90	-38.90	76.21
LMf-Rmef	F	58.40	28.50	-40.10	76.36	58.30	29.20	-40.20	76.60	59.10	29.20	-40.60	77.42

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.93	110.73	1.94	111.03	1.93	110.56
b	BCF	1.86	106.42	1.86	106.54	1.86	106.75
c	CDE	1.23	70.73	1.23	70.49	1.22	69.87
d	ADF	1.26	72.09	1.26	71.95	1.27	72.81
Sum			**359.98**		**360.00**		**360.00**

T1 Average Angles	
Angles	Degrees
a	110.77
b	106.57
c	70.36
d	72.28
Sum	**359.99**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.80	28.20	-39.10	51.39	-18.00	28.00	-38.80	51.12	-18.10	28.10	-39.60	51.82
RMef-LMef	B	-42.60	-0.10	-1.30	42.62	-42.00	-0.10	-1.40	42.02	-42.40	0.10	-0.90	42.41
LMf-Lmef	C	16.90	30.30	-41.20	53.86	16.80	30.40	-41.40	54.04	17.10	30.10	-41.10	53.74
RMf-LMf	D	-77.30	-2.20	0.80	77.34	-76.80	-2.50	1.20	76.85	-77.60	-1.90	0.60	77.63
RMf-Lmef	E	-60.40	28.10	-40.40	77.91	-60.00	27.90	-40.20	77.42	-60.50	28.20	-40.50	78.08
LMf-Rmef	F	59.50	30.40	-39.90	77.82	58.80	30.50	-40.00	77.38	59.50	30.00	-40.20	77.82

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.60		1.96	112.08		1.95	111.51
b	BCF	1.87	106.95		1.86	106.65		1.88	107.49
c	CDE	1.23	70.27		1.22	70.07		1.23	70.26
d	ADF	1.24	71.17		1.24	71.20		1.23	70.73
Sum			360.00			360.00			360.00

T2 Average Angles	
Angles	Degrees
a	111.73
b	107.03
c	70.20
d	71.04
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.96
b	0.46
c	-0.16
d	-1.25

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.40	-57.53	-16.67
Landmark 2	Lmef	21.70	-59.83	-16.97
Landmark 3	RMf	-39.50	-7.17	-56.13
Landmark 4	LMf	43.73	-9.43	-55.87

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.36	0.31	0.15
Landmark 2	Lmef	0.26	0.32	0.12
Landmark 3	RMf	0.26	0.59	0.15
Landmark 4	LMf	0.31	0.25	0.49

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.80	-57.20	-16.50	-21.30	-57.60	-16.80	-21.10	-57.80	-16.70
Landmark 2	Lmef	21.40	-60.20	-17.10	21.80	-59.60	-16.90	21.90	-59.70	-16.90
Landmark 3	RMf	-39.80	-7.60	-56.10	-39.30	-6.50	-56.30	-39.40	-7.40	-56.00
Landmark 4	LMf	44.00	-9.20	-56.10	43.80	-9.40	-56.20	43.40	-9.70	-55.30

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-43.10	2.30	0.30	43.16
RMf to LMf	-83.23	2.27	-0.27	83.26
RMf to Rmef	-18.10	50.37	-39.47	66.50
LMf to Lmef	22.03	50.40	-38.90	67.37
RMf to Lmef	-61.20	52.67	-39.17	89.74
LMf to Rmef	65.13	48.10	-39.20	89.96

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-23.87	-64.27	-5.57
Landmark 2	Lmef	20.87	-64.43	-4.57
Landmark 3	RMf	-44.00	-10.17	-50.67
Landmark 4	LMf	43.93	-10.57	-46.97

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.35	0.31	0.06
Landmark 2	Lmef	0.06	0.23	0.06
Landmark 3	RMf	0.35	0.21	0.21
Landmark 4	LMf	0.25	0.47	0.35

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.90	-64.20	-5.60	-23.50	-64.60	-5.50	-24.20	-64.00	-5.60
Landmark 2	Lmef	20.90	-64.70	-4.60	20.80	-64.30	-4.60	20.90	-64.30	-4.50
Landmark 3	RMf	-43.80	-10.10	-50.90	-43.80	-10.00	-50.60	-44.40	-10.40	-50.50
Landmark 4	LMf	43.70	-10.20	-46.60	43.90	-10.40	-47.30	44.20	-11.10	-47.00

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-44.73	0.17	-1.00	44.74
RMf to LMf	-87.93	0.40	-3.70	88.01
RMf to Rmef	-20.13	54.10	-45.10	73.25
LMf to Lmef	23.07	53.87	-42.40	72.33
RMf to Lmef	-64.87	54.27	-46.10	96.32
LMf to Rmef	67.80	53.70	-41.40	95.89

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.58
RMf to LMf	4.75
RMf to Rmef	6.76
LMf to Lmef	4.96
RMf to Lmef	6.58
LMf to Rmef	5.93

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.00	49.60	-39.60	65.97	-18.00	51.10	-39.50	67.05	-18.30	50.40	-39.30	66.48
RMef-LMef	B	-43.20	3.00	0.60	43.31	-43.10	2.00	0.10	43.15	-43.00	1.90	0.20	43.04
LMf-Lmef	C	22.60	51.00	-39.00	68.06	22.00	50.20	-39.30	67.44	21.50	50.00	-38.40	66.61
RMf-LMf	D	-83.80	1.60	0.00	83.82	-83.10	2.90	-0.10	83.15	-82.80	2.30	-0.70	82.83
RMf-Lmef	E	-61.20	52.60	-39.00	89.63	-61.10	53.10	-39.40	90.03	-61.30	52.30	-39.10	89.56
LMf-Rmef	F	65.80	48.00	-39.60	90.56	65.10	48.20	-39.40	90.08	64.50	48.10	-38.60	89.24

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.89	108.42	1.88	107.59	1.88	107.80
b	BCF	1.86	106.69	1.87	107.02	1.87	106.98
c	CDE	1.25	71.48	1.27	72.58	1.27	72.73
d	ADF	1.28	73.31	1.27	72.81	1.26	72.47
Sum			**359.90**		**359.99**		**359.98**

T1 Average Angles	
Angles	Degrees
a	107.93
b	106.90
c	72.26
d	72.86
Sum	**359.96**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.90	54.10	-45.30	73.31	-20.30	54.60	-45.10	73.67	-20.20	53.60	-44.90	72.78
RMef-LMef	B	-44.80	0.50	-1.00	44.81	-44.30	-0.30	-0.90	44.31	-45.10	0.30	-1.10	45.11
LMf-Lmef	C	22.80	54.50	-42.00	72.49	23.10	53.90	-42.70	72.54	23.30	53.20	-42.50	71.97
RMf-LMf	D	-87.50	0.10	-4.30	87.61	-87.70	0.40	-3.30	87.76	-88.60	0.70	-3.50	88.67
RMf-Lmef	E	-64.70	54.60	-46.30	96.49	-64.60	54.30	-46.00	96.11	-65.30	53.90	-46.00	96.36
LMf-Rmef	F	67.60	54.00	-41.00	95.74	67.40	54.20	-41.80	96.06	68.40	52.90	-41.40	95.87

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.06		1.86	106.43		1.87	107.30
b	BCF	1.87	107.05		1.89	108.15		1.88	107.72
c	CDE	1.28	73.45		1.27	72.98		1.27	72.88
d	ADF	1.26	72.41		1.26	72.44		1.26	72.09
Sum			359.96			360.00			359.99

T2 Average Angles		
Angles		Degrees
a		106.93
b		107.64
c		73.10
d		72.31
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-1.00
b	0.74
c	0.84
d	-0.55

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-25.43	-60.90	-10.60
Landmark 2	Lmef	19.17	-60.60	-12.40
Landmark 3	RMf	-41.50	-22.10	-41.70
Landmark 4	LMf	34.47	-25.70	-44.67

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.31	0.10	0.10
Landmark 2	Lmef	0.12	0.10	0.10
Landmark 3	RMf	0.17	0.46	0.46
Landmark 4	LMf	0.12	0.46	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-25.50	-60.90	-10.60	-25.10	-61.00	-10.70	-25.70	-60.80	-10.50
Landmark 2	Lmef	19.10	-60.70	-12.40	19.30	-60.50	-12.30	19.10	-60.60	-12.50
Landmark 3	RMf	-41.40	-22.60	-42.10	-41.70	-22.00	-41.80	-41.40	-21.70	-41.20
Landmark 4	LMf	34.40	-25.20	-44.80	34.60	-25.80	-44.50	34.40	-26.10	-44.70

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-44.60	-0.30	1.80	44.64
RMf to LMf	-75.97	3.60	2.97	76.11
RMf to Rmef	-16.07	38.80	-31.10	52.26
LMf to Lmef	15.30	34.90	-32.27	49.93
RMf to Lmef	-60.67	38.50	-29.30	77.60
LMf to Rmef	59.90	35.20	-34.07	77.38

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-25.93	-66.33	-7.23
Landmark 2	Lmef	19.50	-66.50	-8.47
Landmark 3	RMf	-41.87	-22.47	-41.40
Landmark 4	LMf	37.57	-26.80	-42.17

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.25	0.31	0.06
Landmark 2	Lmef	0.10	0.10	0.06
Landmark 3	RMf	0.32	0.21	0.56
Landmark 4	LMf	0.12	0.46	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-26.20	-66.00	-7.20	-25.70	-66.60	-7.30	-25.90	-66.40	-7.20
Landmark 2	Lmef	19.60	-66.40	-8.50	19.50	-66.50	-8.50	19.40	-66.60	-8.40
Landmark 3	RMf	-41.50	-22.40	-40.90	-42.10	-22.30	-42.00	-42.00	-22.70	-41.30
Landmark 4	LMf	37.50	-26.30	-42.20	37.70	-27.20	-42.10	37.50	-26.90	-42.20

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-45.43	0.17	1.23	45.45
RMf to LMf	-79.43	4.33	0.77	79.56
RMf to Rmef	-15.93	43.87	-34.17	57.84
LMf to Lmef	18.07	39.70	-33.70	55.12
RMf to Lmef	-61.37	44.03	-32.93	82.40
LMf to Rmef	63.50	39.53	-34.93	82.56

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.81
RMf to LMf	3.45
RMf to Rmef	5.58
LMf to Lmef	5.19
RMf to Lmef	4.80
LMf to Rmef	5.18

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-15.90	38.30	-31.50	52.08	-16.60	39.00	-31.10	52.57	-15.70	39.10	-30.70	52.13
RMef-LMef	B	-44.60	-0.20	1.80	44.64	-44.40	-0.50	1.60	44.43	-44.80	-0.20	2.00	44.85
LMf-Lmef	C	15.30	35.50	-32.40	50.44	15.30	34.70	-32.20	49.75	15.30	34.50	-32.20	49.61
RMf-LMf	D	-75.80	2.60	2.70	75.89	-76.30	3.80	2.70	76.44	-75.80	4.40	3.50	76.01
RMf-Lmef	E	-60.50	38.10	-29.70	77.42	-61.00	38.50	-29.50	77.93	-60.50	38.90	-28.70	77.44
LMf-Rmef	F	59.90	35.70	-34.20	77.67	59.70	35.20	-33.80	77.11	60.10	34.70	-34.20	77.37

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.85	106.10		1.86	106.61		1.85	105.74
b	BCF	1.91	109.40		1.92	109.78		1.92	109.89
c	CDE	1.26	72.44		1.27	72.83		1.27	72.71
d	ADF	1.26	72.02		1.23	70.66		1.25	71.54
Sum			359.97			359.89			359.88

T1 Average Angles	
Angles	Degrees
a	106.15
b	109.69
c	72.66
d	71.41
Sum	359.91

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-15.30	43.60	-33.70	57.19	-16.40	44.30	-34.70	58.61	-16.10	43.70	-34.10	57.72
RMef-LMef	B	-45.80	0.40	1.30	45.82	-45.20	-0.10	1.20	45.22	-45.30	0.20	1.20	45.32
LMf-Lmef	C	17.90	40.10	-33.70	55.35	18.20	39.30	-33.60	54.82	18.10	39.70	-33.80	55.19
RMf-LMf	D	-79.00	3.90	1.30	79.11	-79.80	4.90	0.10	79.95	-79.50	4.20	0.90	79.62
RMf-Lmef	E	-61.10	44.00	-32.40	81.97	-61.60	44.20	-33.50	82.89	-61.40	43.90	-32.90	82.34
LMf-Rmef	F	63.70	39.70	-35.00	82.82	63.40	39.40	-34.80	82.36	63.40	39.50	-35.00	82.49

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.83	104.91		1.84	105.21		1.84	105.46
b	BCF	1.91	109.52		1.93	110.47		1.92	109.93
c	CDE	1.27	72.71		1.28	73.25		1.27	72.76
d	ADF	1.27	72.84		1.24	71.04		1.25	71.83
Sum			359.98			359.97			359.98

T2 Average Angles		
Angles		Degrees
a		105.19
b		109.98
c		72.90
d		71.91
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.96
b	0.29
c	0.24
d	0.50

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.30	-51.73	-15.37
Landmark 2	Lmef	20.07	-49.47	-19.50
Landmark 3	RMf	-40.27	-19.53	-50.57
Landmark 4	LMf	32.17	-13.57	-56.40

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.12	0.12
Landmark 2	Lmef	0.15	0.06	0.10
Landmark 3	RMf	0.12	0.47	0.25
Landmark 4	LMf	0.15	0.50	0.53

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.40	-51.60	-15.30	-20.30	-51.80	-15.30	-20.20	-51.80	-15.50
Landmark 2	Lmef	20.20	-49.40	-19.60	19.90	-49.50	-19.50	20.10	-49.50	-19.40
Landmark 3	RMf	-40.40	-19.70	-50.60	-40.20	-19.90	-50.30	-40.20	-19.00	-50.80
Landmark 4	LMf	32.20	-14.10	-57.00	32.30	-13.50	-56.00	32.00	-13.10	-56.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.37	-2.27	4.13	40.64
RMf to LMf	-72.43	-5.97	5.83	72.91
RMf to Rmef	-19.97	32.20	-35.20	51.72
LMf to Lmef	12.10	35.90	-36.90	52.89
RMf to Lmef	-60.33	29.93	-31.07	74.17
LMf to Rmef	52.47	38.17	-41.03	76.77

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.63	-59.23	-16.90
Landmark 2	Lmef	22.43	-55.77	-20.73
Landmark 3	RMf	-40.07	-18.93	-52.83
Landmark 4	LMf	34.50	-16.90	-59.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.06	0.00
Landmark 2	Lmef	0.12	0.12	0.06
Landmark 3	RMf	0.45	0.21	0.25
Landmark 4	LMf	0.10	0.40	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.60	-59.20	-16.90	-18.60	-59.30	-16.90	-18.70	-59.20	-16.90
Landmark 2	Lmef	22.50	-55.70	-20.70	22.50	-55.70	-20.70	22.30	-55.90	-20.80
Landmark 3	RMf	-40.50	-19.00	-53.10	-40.10	-19.10	-52.80	-39.60	-18.70	-52.60
Landmark 4	LMf	34.40	-16.50	-59.20	34.60	-16.90	-59.10	34.50	-17.30	-59.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.07	-3.47	3.83	41.39
RMf to LMf	-74.57	-2.03	6.30	74.86
RMf to Rmef	-21.43	40.30	-35.93	58.09
LMf to Lmef	12.07	38.87	-38.40	55.95
RMf to Lmef	-62.50	36.83	-32.10	79.33
LMf to Rmef	53.13	42.33	-42.23	79.99

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.75
RMf to LMf	1.95
RMf to Rmef	6.38
LMf to Lmef	3.07
RMf to Lmef	5.16
LMf to Rmef	3.23

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.00	31.90	-35.30	51.61	-19.90	31.90	-35.00	51.37	-20.00	32.80	-35.30	52.17
RMef-LMef	B	-40.60	-2.20	4.30	40.89	-40.20	-2.30	4.20	40.48	-40.30	-2.30	3.90	40.55
LMf-Lmef	C	12.00	35.30	-37.40	52.81	12.40	36.00	-36.50	52.74	11.90	36.40	-36.80	53.11
RMf-LMf	D	-72.60	-5.60	6.40	73.10	-72.50	-6.40	5.70	73.00	-72.20	-5.90	5.40	72.64
RMf-Lmef	E	-60.60	29.70	-31.00	74.27	-60.10	29.60	-30.80	73.73	-60.30	30.50	-31.40	74.51
LMf-Rmef	F	52.60	37.50	-41.70	76.89	52.60	38.30	-40.70	76.75	52.20	38.70	-40.70	76.67

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.85	106.24	1.85	106.18	1.85	106.27
b	BCF	1.91	109.64	1.92	110.12	1.91	109.16
c	CDE	1.23	70.19	1.22	69.68	1.23	70.74
d	ADF	1.29	73.88	1.29	73.91	1.29	73.76
Sum			**359.95**		**359.89**		**359.93**

T1 Average Angles	
Angles	Degrees
a	106.23
b	109.64
c	70.20
d	73.85
Sum	**359.92**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.90	40.20	-36.20	58.36	-21.50	40.20	-35.90	58.03	-20.90	40.50	-35.70	57.89
RMef-LMef	B	-41.10	-3.50	3.80	41.42	-41.10	-3.60	3.80	41.43	-41.00	-3.30	3.90	41.32
LMf-Lmef	C	11.90	39.20	-38.50	56.22	12.10	38.80	-38.40	55.91	12.20	38.60	-38.30	55.73
RMf-LMf	D	-74.90	-2.50	6.10	75.19	-74.70	-2.20	6.30	75.00	-74.10	-1.40	6.50	74.40
RMf-Lmef	E	-63.00	36.70	-32.40	79.79	-62.60	36.60	-32.10	79.30	-61.90	37.20	-31.80	78.91
LMf-Rmef	F	53.00	42.70	-42.30	80.13	53.20	42.40	-42.20	80.06	53.20	41.90	-42.20	79.79

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.83	104.90		1.82	104.51		1.82	104.13
b	BCF	1.91	109.38		1.92	109.75		1.91	109.72
c	CDE	1.28	73.17		1.27	72.93		1.28	73.07
d	ADF	1.27	72.51		1.27	72.74		1.27	72.99
Sum			359.95			359.93			359.92

T2 Average Angles		
Angles		Degrees
a		104.52
b		109.62
c		73.06
d		72.75
Sum		359.93

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-1.71
b	-0.02
c	2.85
d	-1.11

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.33	-54.33	-12.90
Landmark 2	Lmef	25.23	-54.47	-13.20
Landmark 3	RMf	-36.10	-23.80	-53.20
Landmark 4	LMf	41.47	-21.70	-53.10

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.15	0.10
Landmark 2	Lmef	0.06	0.06	0.00
Landmark 3	RMf	0.20	0.66	0.17
Landmark 4	LMf	0.15	0.62	0.17

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.30	-54.30	-12.90	-17.30	-54.50	-13.00	-17.40	-54.20	-12.80
Landmark 2	Lmef	25.20	-54.50	-13.20	25.20	-54.50	-13.20	25.30	-54.40	-13.20
Landmark 3	RMf	-35.90	-23.10	-53.30	-36.10	-24.40	-53.00	-36.30	-23.90	-53.30
Landmark 4	LMf	41.60	-21.90	-52.90	41.30	-22.20	-53.20	41.50	-21.00	-53.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.57	0.13	0.30	42.57
RMf to LMf	-77.57	-2.10	-0.10	77.60
RMf to Rmef	-18.77	30.53	-40.30	53.93
LMf to Lmef	16.23	32.77	-39.90	54.12
RMf to Lmef	-61.33	30.67	-40.00	79.39
LMf to Rmef	58.80	32.63	-40.20	78.35

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-16.13	-68.90	-18.00
Landmark 2	Lmef	27.43	-68.57	-17.80
Landmark 3	RMf	-36.40	-29.50	-58.53
Landmark 4	LMf	44.97	-28.30	-57.80

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.20	0.10
Landmark 2	Lmef	0.15	0.06	0.10
Landmark 3	RMf	0.17	0.56	0.35
Landmark 4	LMf	0.25	0.66	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.20	-68.90	-18.10	-16.10	-68.70	-17.90	-16.10	-69.10	-18.00
Landmark 2	Lmef	27.40	-68.60	-17.90	27.30	-68.60	-17.70	27.60	-68.50	-17.80
Landmark 3	RMf	-36.60	-29.40	-58.90	-36.30	-29.00	-58.50	-36.30	-30.10	-58.20
Landmark 4	LMf	45.20	-28.20	-58.00	44.70	-27.70	-57.80	45.00	-29.00	-57.60

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-43.57	-0.33	-0.20	43.57
RMf to LMf	-81.37	-1.20	-0.73	81.38
RMf to Rmef	-20.27	39.40	-40.53	60.05
LMf to Lmef	17.53	40.27	-40.00	59.40
RMf to Lmef	-63.83	39.07	-40.73	85.21
LMf to Rmef	61.10	40.60	-39.80	83.46

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.00
RMf to LMf	3.78
RMf to Rmef	6.12
LMf to Lmef	5.28
RMf to Lmef	5.82
LMf to Rmef	5.11

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.60	31.20	-40.40	54.33	-18.80	30.10	-40.00	53.47	-18.90	30.30	-40.50	54.00
RMef-LMef	B	-42.50	0.20	0.30	42.50	-42.50	0.00	0.20	42.50	-42.70	0.20	0.40	42.70
LMf-Lmef	C	16.40	32.60	-39.70	53.92	16.10	32.30	-40.00	53.87	16.20	33.40	-40.00	54.57
RMf-LMf	D	-77.50	-1.20	-0.40	77.51	-77.40	-2.20	0.20	77.43	-77.80	-2.90	-0.10	77.85
RMf-Lmef	E	-61.10	31.40	-40.10	79.54	-61.30	30.10	-39.80	79.04	-61.60	30.50	-40.10	79.58
LMf-Rmef	F	58.90	32.40	-40.00	78.22	58.60	32.30	-40.20	78.06	58.90	33.20	-40.40	78.76

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.92	109.86	1.93	110.37	1.92	110.22
b	BCF	1.88	107.85	1.88	107.60	1.88	107.51
c	CDE	1.26	71.96	1.25	71.48	1.25	71.43
d	ADF	1.23	70.29	1.23	70.52	1.23	70.74
Sum			**359.96**		**359.96**		**359.90**

T1 Average Angles	
Angles	Degrees
a	110.15
b	107.65
c	71.62
d	70.52
Sum	**359.94**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.40	39.50	-40.80	60.34	-20.20	39.70	-40.60	60.27	-20.20	39.00	-40.20	59.54
RMef-LMef	B	-43.60	-0.30	-0.20	43.60	-43.40	-0.10	-0.20	43.40	-43.70	-0.60	-0.20	43.70
LMf-Lmef	C	17.80	40.40	-40.10	59.64	17.40	40.90	-40.10	59.86	17.40	39.50	-39.80	58.71
RMf-LMf	D	-81.80	-1.20	-0.90	81.81	-81.00	-1.30	-0.70	81.01	-81.30	-1.10	-0.60	81.31
RMf-Lmef	E	-64.00	39.20	-41.00	85.52	-63.60	39.60	-40.80	85.31	-63.90	38.40	-40.40	84.79
LMf-Rmef	F	61.40	40.70	-39.90	83.78	60.80	41.00	-39.90	83.48	61.10	40.10	-39.60	83.12

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.67		1.91	109.68		1.91	109.47
b	BCF	1.88	107.46		1.86	106.81		1.88	107.61
c	CDE	1.27	72.49		1.27	72.80		1.27	72.52
d	ADF	1.23	70.38		1.23	70.71		1.23	70.41
Sum			359.99			359.99			360.00

T2 Average Angles		
Angles		Degrees
a		109.61
b		107.29
c		72.60
d		70.50
Sum		359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.54
b	-0.36
c	0.98
d	-0.02

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.07	-44.00	-12.53
Landmark 2	Lmef	19.73	-42.73	-13.97
Landmark 3	RMf	-41.97	-11.97	-51.67
Landmark 4	LMf	37.90	-8.80	-56.53

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.00	0.12
Landmark 2	Lmef	0.23	0.12	0.06
Landmark 3	RMf	0.15	0.25	0.21
Landmark 4	LMf	0.30	0.26	0.23

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.10	-44.00	-12.60	-20.00	-44.00	-12.40	-20.10	-44.00	-12.60
Landmark 2	Lmef	20.00	-42.60	-14.00	19.60	-42.80	-13.90	19.60	-42.80	-14.00
Landmark 3	RMf	-41.80	-12.00	-51.60	-42.10	-12.20	-51.90	-42.00	-11.70	-51.50
Landmark 4	LMf	37.90	-8.60	-56.80	37.60	-8.70	-56.40	38.20	-9.10	-56.40

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.80	-1.27	1.43	39.85
RMf to LMf	-79.87	-3.17	4.87	80.08
RMf to Rmef	-21.90	32.03	-39.13	55.11
LMf to Lmef	18.17	33.93	-42.57	57.39
RMf to Lmef	-61.70	30.77	-37.70	78.58
LMf to Rmef	57.97	35.20	-44.00	80.84

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.13	-51.53	-3.13
Landmark 2	Lmef	24.33	-48.10	-4.00
Landmark 3	RMf	-42.57	-15.87	-41.73
Landmark 4	LMf	41.93	-9.53	-48.00

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.06	0.06
Landmark 2	Lmef	0.31	0.36	0.10
Landmark 3	RMf	0.21	0.15	0.32
Landmark 4	LMf	0.31	0.29	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.20	-51.50	-3.10	-17.00	-51.50	-3.20	-17.20	-51.60	-3.10
Landmark 2	Lmef	24.40	-48.00	-4.00	24.00	-48.50	-4.10	24.60	-47.80	-3.90
Landmark 3	RMf	-42.50	-15.70	-41.60	-42.80	-15.90	-41.50	-42.40	-16.00	-42.10
Landmark 4	LMf	41.60	-9.70	-48.00	42.20	-9.70	-48.20	42.00	-9.20	-47.80

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.47	-3.43	0.87	41.62
RMf to LMf	-84.50	-6.33	6.27	84.97
RMf to Rmef	-25.43	35.67	-38.60	58.39
LMf to Lmef	17.60	38.57	-44.00	61.10
RMf to Lmef	-66.90	32.23	-37.73	83.30
LMf to Rmef	59.07	42.00	-44.87	85.24

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.77
RMf to LMf	4.89
RMf to Rmef	3.28
LMf to Lmef	3.71
RMf to Lmef	4.72
LMf to Rmef	4.40

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.70	32.00	-39.00	54.92	-22.10	31.80	-39.50	55.32	-21.90	32.30	-38.90	55.10
RMef-LMef	B	-40.10	-1.40	1.40	40.15	-39.60	-1.20	1.50	39.65	-39.70	-1.20	1.40	39.74
LMf-Lmef	C	17.90	34.00	-42.80	57.52	18.00	34.10	-42.50	57.39	18.60	33.70	-42.40	57.27
RMf-LMf	D	-79.70	-3.40	5.20	79.94	-79.70	-3.50	4.50	79.90	-80.20	-2.60	4.90	80.39
RMf-Lmef	E	-61.80	30.60	-37.60	78.55	-61.70	30.60	-38.00	78.66	-61.60	31.10	-37.50	78.54
LMf-Rmef	F	58.00	35.40	-44.20	81.06	57.60	35.30	-44.00	80.62	58.30	34.90	-43.80	80.84

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.93	110.46	1.93	110.77	1.93	110.76
b	BCF	1.94	110.94	1.94	111.06	1.95	111.61
c	CDE	1.18	67.43	1.18	67.63	1.17	67.16
d	ADF	1.24	71.16	1.23	70.54	1.23	70.46
Sum			359.99		360.00		359.99

T1 Average Angles	
Angles	Degrees
a	110.66
b	111.20
c	67.41
d	70.72
Sum	359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-25.30	35.80	-38.50	58.34	-25.80	35.60	-38.30	58.31	-25.20	35.60	-39.00	58.51
RMef-LMef	B	-41.60	-3.50	0.90	41.76	-41.00	-3.00	0.90	41.12	-41.80	-3.80	0.80	41.98
LMf-Lmef	C	17.20	38.30	-44.00	60.82	18.20	38.80	-44.10	61.49	17.40	38.60	-43.90	60.99
RMf-LMf	D	-84.10	-6.00	6.40	84.56	-85.00	-6.20	6.70	85.49	-84.40	-6.80	5.70	84.87
RMf-Lmef	E	-66.90	32.30	-37.60	83.26	-66.80	32.60	-37.40	83.21	-67.00	31.80	-38.20	83.42
LMf-Rmef	F	58.80	41.80	-44.90	84.97	59.20	41.80	-45.00	85.30	59.20	42.40	-44.70	85.44

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.49		1.96	112.47		1.94	111.17
b	BCF	1.93	110.50		1.94	110.91		1.93	110.80
c	CDE	1.18	67.62		1.16	66.66		1.18	67.49
d	ADF	1.23	70.26		1.22	69.87		1.23	70.44
Sum			359.86			359.90			359.90

T2 Average Angles		
Angles		Degrees
a		111.71
b		110.73
c		67.26
d		70.19
Sum		359.89

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.05
b	-0.47
c	-0.15
d	-0.53

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-15.97	-40.93	-12.10
Landmark 2	Lmef	24.73	-38.37	-13.43
Landmark 3	RMf	-34.37	-8.93	-47.33
Landmark 4	LMf	39.47	-7.23	-51.30

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.12	0.10
Landmark 2	Lmef	0.12	0.06	0.06
Landmark 3	RMf	0.06	0.21	0.25
Landmark 4	LMf	0.31	0.12	0.26

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.10	-40.80	-12.10	-15.90	-41.00	-12.20	-15.90	-41.00	-12.00
Landmark 2	Lmef	24.80	-38.30	-13.40	24.80	-38.40	-13.50	24.60	-38.40	-13.40
Landmark 3	RMf	-34.30	-9.10	-47.30	-34.40	-8.70	-47.60	-34.40	-9.00	-47.10
Landmark 4	LMf	39.20	-7.30	-51.50	39.40	-7.10	-51.00	39.80	-7.30	-51.40

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.70	-2.57	1.33	40.80
RMf to LMf	-73.83	-1.70	3.97	73.96
RMf to Rmef	-18.40	32.00	-35.23	51.03
LMf to Lmef	14.73	31.13	-37.87	51.19
RMf to Lmef	-59.10	29.43	-33.90	74.22
LMf to Rmef	55.43	33.70	-39.20	75.80

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.87	-49.63	-6.03
Landmark 2	Lmef	21.73	-48.57	-6.13
Landmark 3	RMf	-38.23	-12.17	-43.70
Landmark 4	LMf	40.40	-12.93	-45.33

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.12	0.12
Landmark 2	Lmef	0.12	0.06	0.25
Landmark 3	RMf	0.21	0.25	0.17
Landmark 4	LMf	0.36	0.45	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.90	-49.70	-6.10	-20.70	-49.70	-6.10	-21.00	-49.50	-5.90
Landmark 2	Lmef	21.80	-48.60	-5.90	21.80	-48.50	-6.10	21.60	-48.60	-6.40
Landmark 3	RMf	-38.00	-12.40	-43.50	-38.40	-11.90	-43.80	-38.30	-12.20	-43.80
Landmark 4	LMf	40.10	-13.40	-45.30	40.30	-12.90	-45.40	40.80	-12.50	-45.30

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.60	-1.07	0.10	42.61
RMf to LMf	-78.63	0.77	1.63	78.65
RMf to Rmef	-17.37	37.47	-37.67	55.89
LMf to Lmef	18.67	35.63	-39.20	56.17
RMf to Lmef	-59.97	36.40	-37.57	79.58
LMf to Rmef	61.27	36.70	-39.30	81.52

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.81
RMf to LMf	4.69
RMf to Rmef	4.87
LMf to Lmef	4.98
RMf to Lmef	5.36
LMf to Rmef	5.72

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.20	31.70	-35.20	50.75	-18.50	32.30	-35.40	51.37	-18.50	32.00	-35.10	50.97
RMef-LMef	B	-40.90	-2.50	1.30	41.00	-40.70	-2.60	1.30	40.80	-40.50	-2.60	1.40	40.61
LMf-Lmef	C	14.40	31.00	-38.10	51.19	14.60	31.30	-37.50	50.98	15.20	31.10	-38.00	51.40
RMf-LMf	D	-73.50	-1.80	4.20	73.64	-73.80	-1.60	3.40	73.90	-74.20	-1.70	4.30	74.34
RMf-Lmef	E	-59.10	29.20	-33.90	74.13	-59.20	29.70	-34.10	74.50	-59.00	29.40	-33.70	74.03
LMf-Rmef	F	55.30	33.50	-39.40	75.71	55.30	33.90	-38.80	75.58	55.70	33.70	-39.40	76.10

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.32	1.87	107.29	1.87	107.34
b	BCF	1.92	109.95	1.93	110.38	1.94	111.05
c	CDE	1.23	70.24	1.23	70.54	1.21	69.41
d	ADF	1.26	72.35	1.25	71.68	1.26	72.06
Sum			**359.87**		**359.89**		**359.85**

T1 Average Angles	
Angles	Degrees
a	107.32
b	110.46
c	70.06
d	72.03
Sum	**359.87**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.10	37.30	-37.40	55.52	-17.70	37.80	-37.70	56.24	-17.30	37.30	-37.90	55.92
RMef-LMef	B	-42.70	-1.10	-0.20	42.71	-42.50	-1.20	0.00	42.52	-42.60	-0.90	0.50	42.61
LMf-Lmef	C	18.30	35.20	-39.40	55.91	18.50	35.60	-39.30	56.16	19.20	36.10	-38.90	56.44
RMf-LMf	D	-78.10	1.00	1.80	78.13	-78.70	1.00	1.60	78.72	-79.10	0.30	1.50	79.11
RMf-Lmef	E	-59.80	36.20	-37.60	79.37	-60.20	36.60	-37.70	79.91	-59.90	36.40	-37.40	79.45
LMf-Rmef	F	61.00	36.30	-39.20	81.09	61.00	36.80	-39.30	81.36	61.80	37.00	-39.40	82.10

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.08		1.87	107.19		1.86	106.69
b	BCF	1.92	109.88		1.93	110.31		1.94	111.20
c	CDE	1.23	70.41		1.23	70.40		1.21	69.46
d	ADF	1.27	72.48		1.26	71.97		1.27	72.60
Sum			359.85			359.88			359.97

T2 Average Angles	
Angles	Degrees
a	106.99
b	110.47
c	70.09
d	72.35
Sum	359.90

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	**-0.33**
b	**0.01**
c	**0.03**
d	**0.32**

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.17	-47.73	-10.33
Landmark 2	Lmef	22.13	-47.33	-11.13
Landmark 3	RMf	-34.73	-21.30	-54.67
Landmark 4	LMf	40.30	-20.40	-55.00

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.12	0.12
Landmark 2	Lmef	0.15	0.29	0.12
Landmark 3	RMf	0.12	0.26	0.06
Landmark 4	LMf	0.20	0.26	0.26

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.30	-47.60	-10.40	-18.10	-47.80	-10.40	-18.10	-47.80	-10.20
Landmark 2	Lmef	22.30	-47.50	-11.00	22.10	-47.50	-11.20	22.00	-47.00	-11.20
Landmark 3	RMf	-34.60	-21.20	-54.70	-34.80	-21.60	-54.70	-34.80	-21.10	-54.60
Landmark 4	LMf	40.10	-20.30	-55.30	40.30	-20.70	-54.80	40.50	-20.20	-54.90

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.30	-0.40	0.80	40.31
RMf to LMf	-75.03	-0.90	0.33	75.04
RMf to Rmef	-16.57	26.43	-44.33	54.21
LMf to Lmef	18.17	26.93	-43.87	54.59
RMf to Lmef	-56.87	26.03	-43.53	76.20
LMf to Rmef	58.47	27.33	-44.67	78.49

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.37	-50.10	-5.53
Landmark 2	Lmef	21.67	-49.30	-3.80
Landmark 3	RMf	-35.17	-24.43	-55.10
Landmark 4	LMf	44.27	-23.33	-51.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.26	0.06
Landmark 2	Lmef	0.25	0.17	0.00
Landmark 3	RMf	0.06	0.29	0.35
Landmark 4	LMf	0.12	0.21	0.38

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.30	-50.30	-5.50	-19.60	-49.80	-5.60	-19.20	-50.20	-5.50
Landmark 2	Lmef	21.90	-49.20	-3.80	21.70	-49.50	-3.80	21.40	-49.20	-3.80
Landmark 3	RMf	-35.10	-24.60	-54.90	-35.20	-24.10	-55.50	-35.20	-24.60	-54.90
Landmark 4	LMf	44.40	-23.40	-50.70	44.20	-23.50	-51.30	44.20	-23.10	-51.40

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.03	-0.80	-1.73	41.08
RMf to LMf	-79.43	-1.10	-3.97	79.54
RMf to Rmef	-15.80	25.67	-49.57	58.01
LMf to Lmef	22.60	25.97	-47.33	58.53
RMf to Lmef	-56.83	24.87	-51.30	80.50
LMf to Rmef	63.63	26.77	-45.60	82.73

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.77
RMf to LMf	4.50
RMf to Rmef	3.80
LMf to Lmef	3.94
RMf to Lmef	4.30
LMf to Rmef	4.25

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.30	26.40	-44.30	54.08	-16.70	26.20	-44.30	54.11	-16.70	26.70	-44.40	54.43
RMef-LMef	B	-40.60	-0.10	0.60	40.60	-40.20	-0.30	0.80	40.21	-40.10	-0.80	1.00	40.12
LMf-Lmef	C	17.80	27.20	-44.30	54.95	18.20	26.80	-43.60	54.32	18.50	26.80	-43.70	54.50
RMf-LMf	D	-74.70	-0.90	0.60	74.71	-75.10	-0.90	0.10	75.11	-75.30	-0.90	0.30	75.31
RMf-Lmef	E	-56.90	26.30	-43.70	76.41	-56.90	25.90	-43.50	76.16	-56.80	25.90	-43.40	76.03
LMf-Rmef	F	58.40	27.30	-44.90	78.56	58.40	27.10	-44.40	78.21	58.60	27.60	-44.70	78.70

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.86	106.74		1.86	106.78		1.85	106.05
b	BCF	1.91	109.70		1.93	110.77		1.95	111.66
c	CDE	1.23	70.35		1.22	70.00		1.21	69.60
d	ADF	1.28	73.21		1.26	72.44		1.27	72.68
Sum			**359.99**			**359.99**			**360.00**

T1 Average Angles	
Angles	Degrees
a	106.52
b	110.71
c	69.98
d	72.78
Sum	**359.99**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-15.80	25.70	-49.40	57.88	-15.60	25.70	-49.90	58.26	-16.00	25.60	-49.40	57.89
RMef-LMef	B	-41.20	-1.10	-1.70	41.25	-41.30	-0.30	-1.80	41.34	-40.60	-1.00	-1.70	40.65
LMf-Lmef	C	22.50	25.80	-46.90	58.06	22.50	26.00	-47.50	58.64	22.80	26.10	-47.60	58.88
RMf-LMf	D	-79.50	-1.20	-4.20	79.62	-79.40	-0.60	-4.20	79.51	-79.40	-1.50	-3.50	79.49
RMf-Lmef	E	-57.00	24.60	-51.10	80.41	-56.90	25.40	-51.70	80.97	-56.60	24.60	-51.10	80.12
LMf-Rmef	F	63.70	26.90	-45.20	82.61	63.80	26.30	-45.70	82.77	63.40	27.10	-45.90	82.83

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.22		1.88	107.55		1.88	107.51
b	BCF	1.95	111.44		1.93	110.57		1.94	111.34
c	CDE	1.21	69.45		1.22	69.90		1.20	68.93
d	ADF	1.25	71.89		1.26	71.98		1.26	72.23
Sum			360.00			360.00			360.00

T2 Average Angles		
Angles		Degrees
a		107.43
b		111.12
c		69.42
d		72.03
Sum		360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.90
b	0.41
c	-0.56
d	-0.75

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-23.20	-45.53	-13.03
Landmark 2	Lmef	17.60	-45.33	-12.87
Landmark 3	RMf	-44.27	-16.80	-55.40
Landmark 4	LMf	34.87	-13.00	-57.53

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.15	0.12
Landmark 2	Lmef	0.17	0.15	0.06
Landmark 3	RMf	0.15	0.17	0.17
Landmark 4	LMf	0.23	0.30	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.20	-45.40	-12.90	-23.10	-45.70	-13.10	-23.30	-45.50	-13.10
Landmark 2	Lmef	17.40	-45.50	-12.80	17.70	-45.30	-12.90	17.70	-45.20	-12.90
Landmark 3	RMf	-44.40	-16.70	-55.60	-44.30	-16.70	-55.30	-44.10	-17.00	-55.30
Landmark 4	LMf	35.00	-13.30	-57.60	35.00	-13.00	-57.70	34.60	-12.70	-57.30

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.80	-0.20	-0.17	40.80
RMf to LMf	-79.13	-3.80	2.13	79.25
RMf to Rmef	-21.07	28.73	-42.37	55.36
LMf to Lmef	17.27	32.33	-44.67	57.78
RMf to Lmef	-61.87	28.53	-42.53	80.32
LMf to Rmef	58.07	32.53	-44.50	80.07

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.90	-48.07	-5.97
Landmark 2	Lmef	19.47	-49.17	-8.27
Landmark 3	RMf	-46.80	-17.57	-49.90
Landmark 4	LMf	37.73	-13.80	-56.07

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.32	0.15
Landmark 2	Lmef	0.15	0.15	0.15
Landmark 3	RMf	0.17	0.15	0.17
Landmark 4	LMf	0.06	0.10	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.80	-48.30	-6.00	-21.00	-48.20	-6.10	-20.90	-47.70	-5.80
Landmark 2	Lmef	19.60	-49.00	-8.30	19.50	-49.20	-8.40	19.30	-49.30	-8.10
Landmark 3	RMf	-47.00	-17.40	-50.00	-46.70	-17.60	-49.70	-46.70	-17.70	-50.00
Landmark 4	LMf	37.80	-13.90	-56.00	37.70	-13.80	-56.10	37.70	-13.70	-56.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.37	1.10	2.30	40.45
RMf to LMf	-84.53	-3.77	6.17	84.84
RMf to Rmef	-25.90	30.50	-43.93	59.42
LMf to Lmef	18.27	35.37	-47.80	62.20
RMf to Lmef	-66.27	31.60	-41.63	84.40
LMf to Rmef	58.63	34.27	-50.10	84.39

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.35
RMf to LMf	5.59
RMf to Rmef	4.07
LMf to Lmef	4.42
RMf to Lmef	4.08
LMf to Rmef	4.33

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.20	28.70	-42.70	55.65	-21.20	29.00	-42.20	55.42	-20.80	28.50	-42.20	55.01
RMef-LMef	B	-40.60	0.10	-0.10	40.60	-40.80	-0.40	-0.20	40.80	-41.00	-0.30	-0.20	41.00
LMf-Lmef	C	17.60	32.20	-44.80	57.91	17.30	32.30	-44.80	57.88	16.90	32.50	-44.40	57.56
RMf-LMf	D	-79.40	-3.40	2.00	79.50	-79.30	-3.70	2.40	79.42	-78.70	-4.30	2.00	78.84
RMf-Lmef	E	-61.80	28.80	-42.80	80.50	-62.00	28.60	-42.40	80.37	-61.80	28.20	-42.40	80.08
LMf-Rmef	F	58.20	32.10	-44.70	80.10	58.10	32.70	-44.60	80.21	57.90	32.80	-44.20	79.89

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.97	112.59	1.96	112.40	1.96	112.21
b	BCF	1.88	107.50	1.88	107.49	1.87	107.10
c	CDE	1.22	69.71	1.22	69.64	1.22	69.91
d	ADF	1.22	70.17	1.23	70.45	1.23	70.75
Sum			**359.97**		**359.99**		**359.97**

T1 Average Angles	
Angles	Degrees
a	112.40
b	107.36
c	69.76
d	70.46
Sum	**359.98**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-26.20	30.90	-44.00	59.81	-25.70	30.60	-43.60	59.14	-25.80	30.00	-44.20	59.32
RMef-LMef	B	-40.40	0.70	2.30	40.47	-40.50	1.00	2.30	40.58	-40.20	1.60	2.30	40.30
LMf-Lmef	C	18.20	35.10	-47.70	61.96	18.20	35.40	-47.70	62.13	18.40	35.60	-48.00	62.53
RMf-LMf	D	-84.80	-3.50	6.00	85.08	-84.40	-3.80	6.40	84.73	-84.40	-4.00	6.10	84.71
RMf-Lmef	E	-66.60	31.60	-41.70	84.69	-66.20	31.60	-41.30	84.18	-66.00	31.60	-41.90	84.32
LMf-Rmef	F	58.60	34.40	-50.00	84.36	58.70	34.40	-50.00	84.43	58.60	34.00	-50.30	84.38

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.99	113.85		1.99	113.87		1.99	114.29
b	BCF	1.90	109.10		1.90	108.78		1.89	108.35
c	CDE	1.19	68.26		1.19	67.95		1.19	67.96
d	ADF	1.20	68.69		1.21	69.27		1.21	69.16
Sum			359.90			359.87			359.75

T2 Average Angles		
Angles		Degrees
a		114.01
b		108.74
c		68.06
d		69.04
Sum		359.84

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.60
b	1.38
c	-1.70
d	-1.42

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.57	-57.13	-21.97
Landmark 2	Lmef	21.33	-58.90	-22.17
Landmark 3	RMf	-37.93	-24.83	-62.40
Landmark 4	LMf	41.20	-20.93	-62.20

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.21	0.15
Landmark 2	Lmef	0.25	0.17	0.21
Landmark 3	RMf	0.35	0.21	0.00
Landmark 4	LMf	0.10	0.15	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.50	-57.20	-22.10	-17.80	-56.90	-22.00	-17.40	-57.30	-21.80
Landmark 2	Lmef	21.60	-58.70	-22.00	21.10	-59.00	-22.10	21.30	-59.00	-22.40
Landmark 3	RMf	-37.90	-24.90	-62.40	-38.30	-24.60	-62.40	-37.60	-25.00	-62.40
Landmark 4	LMf	41.30	-21.10	-62.20	41.10	-20.90	-62.30	41.20	-20.80	-62.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-38.90	1.77	0.20	38.94
RMf to LMf	-79.13	-3.90	-0.20	79.23
RMf to Rmef	-20.37	32.30	-40.43	55.61
LMf to Lmef	19.87	37.97	-40.03	58.64
RMf to Lmef	-59.27	34.07	-40.23	79.32
LMf to Rmef	58.77	36.20	-40.23	79.89

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-16.07	-61.63	-23.00
Landmark 2	Lmef	23.43	-63.93	-22.67
Landmark 3	RMf	-35.63	-26.60	-63.70
Landmark 4	LMf	44.67	-24.53	-62.43

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.25	0.15	0.10
Landmark 2	Lmef	0.32	0.25	0.06
Landmark 3	RMf	0.06	0.35	0.26
Landmark 4	LMf	0.21	0.15	0.29

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.10	-61.50	-23.00	-16.30	-61.60	-22.90	-15.80	-61.80	-23.10
Landmark 2	Lmef	23.30	-63.90	-22.70	23.20	-64.20	-22.70	23.80	-63.70	-22.60
Landmark 3	RMf	-35.60	-26.20	-63.80	-35.70	-26.80	-63.40	-35.60	-26.80	-63.90
Landmark 4	LMf	44.90	-24.50	-62.60	44.60	-24.70	-62.60	44.50	-24.40	-62.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.50	2.30	-0.33	39.57
RMf to LMf	-80.30	-2.07	-1.27	80.34
RMf to Rmef	-19.57	35.03	-40.70	57.15
LMf to Lmef	21.23	39.40	-39.77	59.87
RMf to Lmef	-59.07	37.33	-41.03	81.03
LMf to Rmef	60.73	37.10	-39.43	81.36

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.63
RMf to LMf	1.11
RMf to Rmef	1.54
LMf to Lmef	1.23
RMf to Lmef	1.71
LMf to Rmef	1.47

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.40	32.30	-40.30	55.53	-20.50	32.30	-40.40	55.64	-20.20	32.30	-40.60	55.67
RMef-LMef	B	-39.10	1.50	-0.10	39.13	-38.90	2.10	0.10	38.96	-38.70	1.70	0.60	38.74
LMf-Lmef	C	19.70	37.60	-40.20	58.46	20.00	38.10	-40.20	58.89	19.90	38.20	-39.70	58.58
RMf-LMf	D	-79.20	-3.80	-0.20	79.29	-79.40	-3.70	-0.10	79.49	-78.80	-4.20	-0.30	78.91
RMf-Lmef	E	-59.50	33.80	-40.40	79.47	-59.40	34.40	-40.30	79.60	-58.90	34.00	-40.00	78.90
LMf-Rmef	F	58.80	36.10	-40.10	79.80	58.90	36.00	-40.30	79.93	58.60	36.50	-40.30	79.94

T1	Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees		Radians	Degrees
a	ABE	1.97	113.03	1.98	113.41		1.96	112.12
b	BCF	1.89	108.08	1.88	107.82		1.90	108.74
c	CDE	1.20	68.55	1.19	68.38		1.19	68.20
d	ADF	1.22	70.07	1.22	70.01		1.23	70.48
Sum			359.73		359.61			359.54

T1 Average Angles	
Angles	Degrees
a	112.86
b	108.21
c	68.38
d	70.18
Sum	359.63

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.50	35.30	-40.80	57.37	-19.40	34.80	-40.50	56.81	-19.80	35.00	-40.80	57.29
RMef-LMef	B	-39.40	2.40	-0.30	39.47	-39.50	2.60	-0.20	39.59	-39.60	1.90	-0.50	39.65
LMf-Lmef	C	21.60	39.40	-39.90	60.09	21.40	39.50	-39.90	60.09	20.70	39.30	-39.50	59.44
RMf-LMf	D	-80.50	-1.70	-1.20	80.53	-80.30	-2.10	-0.80	80.33	-80.10	-2.40	-1.80	80.16
RMf-Lmef	E	-58.90	37.70	-41.10	81.12	-58.90	37.40	-40.70	80.77	-59.40	36.90	-41.30	81.21
LMf-Rmef	F	61.00	37.00	-39.60	81.60	60.90	36.90	-39.70	81.53	60.30	37.40	-39.00	80.97

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.96	112.46		1.97	112.62		1.96	112.55
b	BCF	1.89	108.29		1.88	107.99		1.88	107.92
c	CDE	1.20	68.70		1.20	68.49		1.21	69.34
d	ADF	1.23	70.28		1.23	70.58		1.22	69.93
Sum			359.73			359.69			359.74

T2 Average Angles		
Angles		Degrees
a		112.54
b		108.07
c		68.84
d		70.27
Sum		359.72

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.31
b	-0.14
c	0.47
d	0.08

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-20.83	-53.80	-22.43
Landmark 2	Lmef	16.47	-53.93	-22.40
Landmark 3	RMf	-39.07	-25.87	-62.47
Landmark 4	LMf	38.00	-24.20	-60.90

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.17	0.15
Landmark 2	Lmef	0.15	0.15	0.10
Landmark 3	RMf	0.23	0.12	0.15
Landmark 4	LMf	0.17	0.17	0.26

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.80	-53.60	-22.30	-20.80	-53.90	-22.40	-20.90	-53.90	-22.60
Landmark 2	Lmef	16.30	-54.10	-22.30	16.60	-53.80	-22.40	16.50	-53.90	-22.50
Landmark 3	RMf	-39.20	-25.80	-62.30	-39.20	-25.80	-62.60	-38.80	-26.00	-62.50
Landmark 4	LMf	38.10	-24.40	-60.80	37.80	-24.10	-61.20	38.10	-24.10	-60.70

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-37.30	0.13	-0.03	37.30
RMf to LMf	-77.07	-1.67	-1.57	77.10
RMf to Rmef	-18.23	27.93	-40.03	52.11
LMf to Lmef	21.53	29.73	-38.50	53.20
RMf to Lmef	-55.53	28.07	-40.07	74.01
LMf to Rmef	58.83	29.60	-38.47	76.27

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.83	-61.10	-19.73
Landmark 2	Lmef	18.50	-60.67	-19.37
Landmark 3	RMf	-40.43	-29.20	-63.23
Landmark 4	LMf	40.87	-26.23	-59.37

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.17	0.06
Landmark 2	Lmef	0.00	0.06	0.06
Landmark 3	RMf	0.21	0.20	0.32
Landmark 4	LMf	0.32	0.35	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.70	-61.20	-19.70	-19.90	-60.90	-19.70	-19.90	-61.20	-19.80
Landmark 2	Lmef	18.50	-60.70	-19.40	18.50	-60.60	-19.30	18.50	-60.70	-19.40
Landmark 3	RMf	-40.50	-29.20	-63.10	-40.20	-29.00	-63.00	-40.60	-29.40	-63.60
Landmark 4	LMf	41.10	-25.90	-59.40	40.50	-26.20	-59.40	41.00	-26.60	-59.30

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-38.33	-0.43	-0.37	38.34
RMf to LMf	-81.30	-2.97	-3.87	81.45
RMf to Rmef	-20.60	31.90	-43.50	57.74
LMf to Lmef	22.37	34.43	-40.00	57.32
RMf to Lmef	-58.93	31.47	-43.87	79.92
LMf to Rmef	60.70	34.87	-39.63	80.44

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.04
RMf to LMf	4.35
RMf to Rmef	5.63
LMf to Lmef	4.13
RMf to Lmef	5.92
LMf to Rmef	4.17

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.40	27.80	-40.00	52.07	-18.40	28.10	-40.20	52.39	-17.90	27.90	-39.90	51.87
RMef-LMef	B	-37.10	0.50	0.00	37.10	-37.40	-0.10	0.00	37.40	-37.40	0.00	-0.10	37.40
LMf-Lmef	C	21.80	29.70	-38.50	53.29	21.20	29.70	-38.80	53.26	21.60	29.80	-38.20	53.05
RMf-LMf	D	-77.30	-1.40	-1.50	77.33	-77.00	-1.70	-1.40	77.03	-76.90	-1.90	-1.80	76.94
RMf-Lmef	E	-55.50	28.30	-40.00	74.03	-55.80	28.00	-40.20	74.25	-55.30	27.90	-40.00	73.73
LMf-Rmef	F	58.90	29.20	-38.50	76.18	58.60	29.80	-38.80	76.34	59.00	29.80	-38.10	76.29

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.94	111.13	1.93	110.48	1.93	110.31
b	BCF	1.98	113.68	1.98	113.55	1.99	113.91
c	CDE	1.15	66.11	1.16	66.61	1.15	66.17
d	ADF	1.20	68.99	1.21	69.32	1.21	69.54
Sum		**359.91**		**359.95**		**359.93**	

T1 Average Angles	
Angles	Degrees
a	110.64
b	113.71
c	66.30
d	69.28
Sum	**359.93**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.80	32.00	-43.40	57.79	-20.30	31.90	-43.30	57.49	-20.70	31.80	-43.80	57.95
RMef-LMef	B	-38.20	-0.50	-0.30	38.20	-38.40	-0.30	-0.40	38.40	-38.40	-0.50	-0.40	38.41
LMf-Lmef	C	22.60	34.80	-40.00	57.64	22.00	34.40	-40.10	57.23	22.50	34.10	-39.90	57.11
RMf-LMf	D	-81.60	-3.30	-3.70	81.75	-80.70	-2.80	-3.60	80.83	-81.60	-2.80	-4.30	81.76
RMf-Lmef	E	-59.00	31.50	-43.70	79.89	-58.70	31.60	-43.70	79.71	-59.10	31.30	-44.20	80.16
LMf-Rmef	F	60.80	35.30	-39.70	80.74	60.40	34.70	-39.70	80.18	60.90	34.60	-39.50	80.41

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.94	111.01		1.94	110.89		1.94	110.97
b	BCF	1.98	113.24		1.96	112.44		1.98	113.23
c	CDE	1.18	67.40		1.19	68.07		1.18	67.86
d	ADF	1.19	68.23		1.20	68.48		1.18	67.82
Sum			359.87			359.89			359.88

T2 Average Angles		
Angles		Degrees
a		110.96
b		112.97
c		67.78
d		68.18
Sum		359.88

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.32
b	-0.74
c	1.48
d	-1.11

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-12.67	-44.33	-10.67
Landmark 2	Lmef	24.67	-43.77	-10.53
Landmark 3	RMf	-32.23	-9.20	-52.87
Landmark 4	LMf	43.97	-8.47	-51.73

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.15	0.06
Landmark 2	Lmef	0.21	0.06	0.06
Landmark 3	RMf	0.06	0.26	0.12
Landmark 4	LMf	0.23	0.15	0.21

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-12.60	-44.30	-10.70	-12.80	-44.20	-10.60	-12.60	-44.50	-10.70
Landmark 2	Lmef	24.60	-43.80	-10.50	24.90	-43.70	-10.60	24.50	-43.80	-10.50
Landmark 3	RMf	-32.20	-9.00	-53.00	-32.20	-9.50	-52.80	-32.30	-9.10	-52.80
Landmark 4	LMf	44.10	-8.50	-51.50	43.70	-8.60	-51.90	44.10	-8.30	-51.80

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-37.33	-0.57	-0.13	37.34
RMf to LMf	-76.20	-0.73	-1.13	76.21
RMf to Rmef	-19.57	35.13	-42.20	58.29
LMf to Lmef	19.30	35.30	-41.20	57.58
RMf to Lmef	-56.90	34.57	-42.33	78.90
LMf to Rmef	56.63	35.87	-41.07	78.61

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-13.00	-45.60	-9.30
Landmark 2	Lmef	25.03	-45.17	-8.77
Landmark 3	RMf	-32.73	-10.90	-52.50
Landmark 4	LMf	44.67	-10.87	-50.20

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.26	0.17	0.17
Landmark 2	Lmef	0.25	0.15	0.12
Landmark 3	RMf	0.15	0.10	0.17
Landmark 4	LMf	0.23	0.12	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-12.70	-45.80	-9.40	-13.10	-45.50	-9.40	-13.20	-45.50	-9.10
Landmark 2	Lmef	25.00	-45.20	-8.70	25.30	-45.00	-8.90	24.80	-45.30	-8.70
Landmark 3	RMf	-32.90	-11.00	-52.70	-32.60	-10.90	-52.40	-32.70	-10.80	-52.40
Landmark 4	LMf	44.80	-11.00	-50.10	44.40	-10.80	-50.30	44.80	-10.80	-50.20

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-38.03	-0.43	-0.53	38.04
RMf to LMf	-77.40	-0.03	-2.30	77.43
RMf to Rmef	-19.73	34.70	-43.20	58.82
LMf to Lmef	19.63	34.30	-41.43	57.26
RMf to Lmef	-57.77	34.27	-43.73	80.15
LMf to Rmef	57.67	34.73	-40.90	78.77

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.70
RMf to LMf	1.22
RMf to Rmef	0.53
LMf to Lmef	-0.33
RMf to Lmef	1.25
LMf to Rmef	0.16

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.60	35.30	-42.30	58.48	-19.40	34.70	-42.20	57.98	-19.70	35.40	-42.10	58.43
RMef-LMef	B	-37.20	-0.50	-0.20	37.20	-37.70	-0.50	0.00	37.70	-37.10	-0.70	-0.20	37.11
LMf-Lmef	C	19.50	35.30	-41.00	57.51	18.80	35.10	-41.30	57.37	19.60	35.50	-41.30	57.88
RMf-LMf	D	-76.30	-0.50	-1.50	76.32	-75.90	-0.90	-0.90	75.91	-76.40	-0.80	-1.00	76.41
RMf-Lmef	E	-56.80	34.80	-42.50	79.02	-57.10	34.20	-42.20	78.81	-56.80	34.70	-42.30	78.86
LMf-Rmef	F	56.70	35.80	-40.80	78.49	56.50	35.60	-41.30	78.52	56.70	36.20	-41.10	78.83

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.91	109.32	1.90	109.07	1.91	109.24
b	BCF	1.92	110.09	1.91	109.62	1.92	110.26
c	CDE	1.24	70.79	1.24	70.95	1.23	70.39
d	ADF	1.22	69.80	1.23	70.36	1.22	70.11
Sum			360.00		360.00		360.00

T1 Average Angles	
Angles	Degrees
a	109.21
b	109.99
c	70.71
d	70.09
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.20	34.80	-43.30	59.11	-19.50	34.60	-43.00	58.54	-19.50	34.70	-43.30	58.82
RMef-LMef	B	-37.70	-0.60	-0.70	37.71	-38.40	-0.50	-0.50	38.41	-38.00	-0.20	-0.40	38.00
LMf-Lmef	C	19.80	34.20	-41.40	57.23	19.10	34.20	-41.40	56.99	20.00	34.50	-41.50	57.55
RMf-LMf	D	-77.70	0.00	-2.60	77.74	-77.00	-0.10	-2.10	77.03	-77.50	0.00	-2.20	77.53
RMf-Lmef	E	-57.90	34.20	-44.00	80.36	-57.90	34.10	-43.50	80.05	-57.50	34.50	-43.70	80.04
LMf-Rmef	F	57.50	34.80	-40.70	78.57	57.50	34.70	-40.90	78.63	58.00	34.70	-41.10	79.10

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.92	110.23		1.91	109.57		1.91	109.64
b	BCF	1.92	109.99		1.91	109.48		1.92	110.06
c	CDE	1.24	71.24		1.25	71.58		1.24	70.92
d	ADF	1.20	68.53		1.21	69.37		1.21	69.37
Sum			360.00			360.00			360.00

T2 Average Angles	
Angles	Degrees
a	109.82
b	109.84
c	71.25
d	69.09
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.60
b	-0.15
c	0.54
d	-1.00

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.80	-56.53	-23.83
Landmark 2	Lmef	21.97	-54.40	-23.83
Landmark 3	RMf	-39.30	-24.00	-61.67
Landmark 4	LMf	42.87	-18.57	-61.07

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.20	0.15	0.06
Landmark 2	Lmef	0.15	0.10	0.15
Landmark 3	RMf	0.10	0.35	0.21
Landmark 4	LMf	0.12	0.35	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.60	-56.70	-23.80	-17.80	-56.50	-23.80	-18.00	-56.40	-23.90
Landmark 2	Lmef	21.80	-54.50	-23.70	22.10	-54.30	-23.80	22.00	-54.40	-24.00
Landmark 3	RMf	-39.40	-24.20	-61.50	-39.20	-24.20	-61.60	-39.30	-23.60	-61.90
Landmark 4	LMf	43.00	-18.60	-61.10	42.80	-18.90	-61.00	42.80	-18.20	-61.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-39.77	-2.13	0.00	39.82
RMf to LMf	-82.17	-5.43	-0.60	82.35
RMf to Rmef	-21.50	32.53	-37.83	54.33
LMf to Lmef	20.90	35.83	-37.23	55.74
RMf to Lmef	-61.27	30.40	-37.83	78.16
LMf to Rmef	60.67	37.97	-37.23	80.67

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-15.90	-61.57	-21.10
Landmark 2	Lmef	25.63	-58.70	-19.40
Landmark 3	RMf	-37.90	-25.73	-62.20
Landmark 4	LMf	48.40	-18.70	-57.90

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.06	0.17
Landmark 2	Lmef	0.25	0.26	0.10
Landmark 3	RMf	0.36	0.12	0.30
Landmark 4	LMf	0.20	0.26	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-15.90	-61.60	-20.90	-15.80	-61.50	-21.20	-16.00	-61.60	-21.20
Landmark 2	Lmef	25.60	-58.60	-19.50	25.40	-59.00	-19.40	25.90	-58.50	-19.30
Landmark 3	RMf	-38.20	-25.80	-61.90	-38.00	-25.80	-62.20	-37.50	-25.60	-62.50
Landmark 4	LMf	48.40	-18.50	-58.00	48.20	-19.00	-57.90	48.60	-18.60	-57.80

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.53	-2.87	-1.70	41.67
RMf to LMf	-86.30	-7.03	-4.30	86.69
RMf to Rmef	-22.00	35.83	-41.10	58.80
LMf to Lmef	22.77	40.00	-38.50	60.00
RMf to Lmef	-63.53	32.97	-42.80	83.40
LMf to Rmef	64.30	42.87	-36.80	85.59

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.84
RMf to LMf	4.34
RMf to Rmef	4.47
LMf to Lmef	4.26
RMf to Lmef	5.24
LMf to Rmef	4.92

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.80	32.50	-37.70	54.34	-21.40	32.30	-37.80	54.13	-21.30	32.80	-38.00	54.53
RMef-LMef	B	-39.40	-2.20	-0.10	39.46	-39.90	-2.20	0.00	39.96	-40.00	-2.00	0.10	40.05
LMf-Lmef	C	21.20	35.90	-37.40	56.01	20.70	35.40	-37.20	55.37	20.80	36.20	-37.10	55.85
RMf-LMf	D	-82.40	-5.60	-0.40	82.59	-82.00	-5.30	-0.60	82.17	-82.10	-5.40	-0.80	82.28
RMf-Lmef	E	-61.20	30.30	-37.80	78.05	-61.30	30.10	-37.80	78.05	-61.30	30.80	-37.90	78.38
LMf-Rmef	F	60.60	38.10	-37.30	80.72	60.60	37.60	-37.20	80.44	60.80	38.20	-37.20	80.87

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.65		1.94	111.22		1.94	111.00
b	BCF	2.00	114.33		1.99	114.11		1.99	113.95
c	CDE	1.14	65.30		1.15	65.83		1.15	65.94
d	ADF	1.20	68.71		1.20	68.83		1.21	69.08
Sum			359.99			359.99			359.97

T1 Average Angles	
Angles	Degrees
a	111.29
b	114.13
c	65.69
d	68.87
Sum	359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-22.30	35.80	-41.00	58.82	-22.20	35.70	-41.00	58.72	-21.50	36.00	-41.30	58.86
RMef-LMef	B	-41.50	-3.00	-1.40	41.63	-41.20	-2.50	-1.80	41.32	-41.90	-3.10	-1.90	42.06
LMf-Lmef	C	22.80	40.10	-38.50	60.08	22.80	40.00	-38.50	60.02	22.70	39.90	-38.50	59.91
RMf-LMf	D	-86.60	-7.30	-3.90	86.99	-86.20	-6.80	-4.30	86.57	-86.10	-7.00	-4.70	86.51
RMf-Lmef	E	-63.80	32.80	-42.40	83.33	-63.40	33.20	-42.80	83.39	-63.40	32.90	-43.20	83.48
LMf-Rmef	F	64.30	43.10	-37.10	85.84	64.00	42.50	-36.70	85.14	64.60	43.00	-36.60	85.80

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.94	110.95		1.95	111.75		1.93	110.52
b	BCF	1.99	113.88		1.97	113.03		1.98	113.42
c	CDE	1.15	66.11		1.16	66.50		1.16	66.67
d	ADF	1.21	69.05		1.20	68.69		1.21	69.38
Sum			359.98			359.98			359.99

T2 Average Angles		
Angles		Degrees
a		111.07
b		113.44
c		66.43
d		69.04
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	**-0.22**
b	**-0.69**
c	**0.73**
d	**0.17**

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.67	-43.93	-3.90
Landmark 2	Lmef	27.37	-42.00	-3.73
Landmark 3	RMf	-37.03	-15.73	-47.93
Landmark 4	LMf	44.23	-12.27	-46.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.15	0.20
Landmark 2	Lmef	0.12	0.10	0.12
Landmark 3	RMf	0.12	0.12	0.29
Landmark 4	LMf	0.15	0.15	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.60	-43.80	-3.70	-18.90	-44.10	-3.90	-18.50	-43.90	-4.10
Landmark 2	Lmef	27.50	-41.90	-3.60	27.30	-42.10	-3.80	27.30	-42.00	-3.80
Landmark 3	RMf	-36.90	-15.60	-48.10	-37.10	-15.80	-47.60	-37.10	-15.80	-48.10
Landmark 4	LMf	44.10	-12.10	-46.20	44.20	-12.30	-46.00	44.40	-12.40	-46.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.03	-1.93	-0.17	46.07
RMf to LMf	-81.27	-3.47	-1.80	81.36
RMf to Rmef	-18.37	28.20	-44.03	55.42
LMf to Lmef	16.87	29.73	-42.40	54.46
RMf to Lmef	-64.40	26.27	-44.20	82.41
LMf to Rmef	62.90	31.67	-42.23	82.11

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.90	-46.43	-0.90
Landmark 2	Lmef	28.77	-44.13	0.20
Landmark 3	RMf	-37.80	-17.57	-48.67
Landmark 4	LMf	49.33	-13.17	-45.43

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.20	0.06	0.00
Landmark 2	Lmef	0.32	0.06	0.17
Landmark 3	RMf	0.20	0.15	0.15
Landmark 4	LMf	0.15	0.12	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.90	-46.40	-0.90	-18.10	-46.40	-0.90	-17.70	-46.50	-0.90
Landmark 2	Lmef	28.90	-44.20	0.30	28.40	-44.10	0.00	29.00	-44.10	0.30
Landmark 3	RMf	-37.60	-17.60	-48.70	-37.80	-17.70	-48.50	-38.00	-17.40	-48.80
Landmark 4	LMf	49.50	-13.30	-45.50	49.20	-13.10	-45.40	49.30	-13.10	-45.40

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-46.67	-2.30	-1.10	46.74
RMf to LMf	-87.13	-4.40	-3.23	87.30
RMf to Rmef	-19.90	28.87	-47.77	59.25
LMf to Lmef	20.57	30.97	-45.63	58.86
RMf to Lmef	-66.57	26.57	-48.87	86.75
LMf to Rmef	67.23	33.27	-44.53	87.24

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.66
RMf to LMf	5.94
RMf to Rmef	3.83
LMf to Lmef	4.39
RMf to Lmef	4.34
LMf to Rmef	5.12

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.30	28.20	-44.40	55.69	-18.20	28.30	-43.70	55.15	-18.60	28.10	-44.00	55.42
RMef-LMef	B	-46.10	-1.90	-0.10	46.14	-46.20	-2.00	-0.10	46.24	-45.80	-1.90	-0.30	45.84
LMf-Lmef	C	16.60	29.80	-42.60	54.57	16.90	29.80	-42.20	54.36	17.10	29.60	-42.40	54.46
RMf-LMf	D	-81.00	-3.50	-1.90	81.10	-81.30	-3.50	-1.60	81.39	-81.50	-3.40	-1.90	81.59
RMf-Lmef	E	-64.40	26.30	-44.50	82.58	-64.40	26.30	-43.80	82.20	-64.40	26.20	-44.30	82.44
LMf-Rmef	F	62.70	31.70	-42.50	82.11	63.10	31.80	-42.10	82.25	62.90	31.50	-42.10	81.98

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.89	108.01	1.89	108.01	1.90	108.63
b	BCF	1.90	108.95	1.91	109.43	1.91	109.34
c	CDE	1.26	72.00	1.25	71.40	1.25	71.45
d	ADF	1.24	71.03	1.24	71.15	1.23	70.57
Sum			359.99		359.99		359.99

T1 Average Angles	
Angles	Degrees
a	108.22
b	109.24
c	71.62
d	70.92
Sum	359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.70	28.80	-47.80	59.18	-19.70	28.70	-47.60	58.97	-20.30	29.10	-47.90	59.61
RMef-LMef	B	-46.80	-2.20	-1.20	46.87	-46.50	-2.30	-0.90	46.57	-46.70	-2.40	-1.20	46.78
LMf-Lmef	C	20.60	30.90	-45.80	58.96	20.80	31.00	-45.40	58.78	20.30	31.00	-45.70	58.84
RMf-LMf	D	-87.10	-4.30	-3.20	87.26	-87.00	-4.60	-3.10	87.18	-87.30	-4.30	-3.40	87.47
RMf-Lmef	E	-66.50	26.60	-49.00	86.78	-66.20	26.40	-48.50	86.21	-67.00	26.70	-49.10	87.25
LMf-Rmef	F	67.40	33.10	-44.60	87.34	67.30	33.30	-44.50	87.28	67.00	33.40	-44.50	87.09

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.28		1.90	108.98		1.91	109.61
b	BCF	1.93	110.71		1.94	111.38		1.93	110.58
c	CDE	1.22	69.75		1.21	69.30		1.22	70.12
d	ADF	1.23	70.25		1.23	70.34		1.22	69.69
Sum			360.00			359.99			360.00

T2 Average Angles		
Angles		Degrees
a		109.29
b		110.89
c		69.72
d		70.09
Sum		359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.07
b	1.65
c	-1.89
d	-0.82

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-24.57	-67.37	-33.53
Landmark 2	Lmef	16.87	-65.47	-33.63
Landmark 3	RMf	-41.87	-21.77	-67.13
Landmark 4	LMf	36.03	-23.30	-67.93

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.29	0.12
Landmark 2	Lmef	0.15	0.23	0.06
Landmark 3	RMf	0.12	0.23	0.21
Landmark 4	LMf	0.12	0.36	0.21

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-24.50	-67.20	-33.40		-24.70	-67.20	-33.60		-24.50	-67.70	-33.60
Landmark 2	Lmef	16.90	-65.60	-33.60		17.00	-65.20	-33.60		16.70	-65.60	-33.70
Landmark 3	RMf	-41.80	-21.90	-67.30		-42.00	-21.90	-66.90		-41.80	-21.50	-67.20
Landmark 4	LMf	36.10	-23.60	-67.70		35.90	-22.90	-68.00		36.10	-23.40	-68.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.43	-1.90	0.10	41.48
RMf to LMf	-77.90	1.53	0.80	77.92
RMf to Rmef	-17.30	45.60	-33.60	59.23
LMf to Lmef	19.17	42.17	-34.30	57.64
RMf to Lmef	-58.73	43.70	-33.50	80.51
LMf to Rmef	60.60	44.07	-34.40	82.45

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-24.77	-68.00	-31.37
Landmark 2	Lmef	17.83	-66.90	-34.30
Landmark 3	RMf	-46.87	-20.53	-65.57
Landmark 4	LMf	34.50	-21.87	-70.83

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.32	0.10	0.12
Landmark 2	Lmef	0.12	0.20	0.10
Landmark 3	RMf	0.12	0.21	0.06
Landmark 4	LMf	0.26	0.06	0.29

		Data Set 1				Data Set 2				Data Set 3		
		X	Y	Z		X	Y	Z		X	Y	Z
Landmark 1	Rmef	-24.90	-67.90	-31.30		-24.40	-68.00	-31.50		-25.00	-68.10	-31.30
Landmark 2	Lmef	17.90	-66.70	-34.30		17.70	-67.10	-34.40		17.90	-66.90	-34.20
Landmark 3	RMf	-47.00	-20.60	-65.60		-46.80	-20.30	-65.60		-46.80	-20.70	-65.50
Landmark 4	LMf	34.80	-21.90	-70.50		34.30	-21.80	-71.00		34.40	-21.90	-71.00

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.60	-1.10	2.93	42.72
RMf to LMf	-81.37	1.33	5.27	81.55
RMf to Rmef	-22.10	47.47	-34.20	62.54
LMf to Lmef	16.67	45.03	-36.53	60.34
RMf to Lmef	-64.70	46.37	-31.27	85.52
LMf to Rmef	59.27	46.13	-39.47	84.84

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.24
RMf to LMf	3.63
RMf to Rmef	3.31
LMf to Lmef	2.70
RMf to Lmef	5.01
LMf to Rmef	2.40

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-17.30	45.30	-33.90	59.17	-17.30	45.30	-33.30	58.82	-17.30	46.20	-33.60	59.69
RMef-LMef	B	-41.40	-1.60	0.20	41.43	-41.70	-2.00	0.00	41.75	-41.20	-2.10	0.10	41.25
LMf-Lmef	C	19.20	42.00	-34.10	57.41	18.90	42.30	-34.40	57.70	19.40	42.20	-34.40	57.80
RMf-LMf	D	-77.90	1.70	0.40	77.92	-77.90	1.00	1.10	77.91	-77.90	1.90	0.90	77.93
RMf-Lmef	E	-58.70	43.70	-33.70	80.57	-59.00	43.30	-33.30	80.40	-58.50	44.10	-33.50	80.56
LMf-Rmef	F	60.60	43.60	-34.30	82.16	60.60	44.30	-34.40	82.57	60.60	44.30	-34.50	82.61

T1		Data Set 1			Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.83	105.06		1.83	104.88		1.82	104.40
b	BCF	1.94	111.43		1.94	111.24		1.95	111.95
c	CDE	1.24	71.25		1.24	70.94		1.24	71.06
d	ADF	1.26	72.18		1.27	72.79		1.26	72.42
Sum			**359.91**			**359.86**			**359.83**

T1 Average Angles	
Angles	Degrees
a	104.78
b	111.54
c	71.08
d	72.46
Sum	**359.87**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-22.10	47.30	-34.30	62.47	-22.40	47.70	-34.10	62.77	-21.80	47.40	-34.20	62.38
RMef-LMef	B	-42.80	-1.20	3.00	42.92	-42.10	-0.90	2.90	42.21	-42.90	-1.20	2.90	43.01
LMf-Lmef	C	16.90	44.80	-36.20	60.03	16.60	45.30	-36.60	60.56	16.50	45.00	-36.80	60.43
RMf-LMf	D	-81.80	1.30	4.90	81.96	-81.10	1.50	5.40	81.29	-81.20	1.20	5.50	81.39
RMf-Lmef	E	-64.90	46.10	-31.30	85.54	-64.50	46.80	-31.20	85.58	-64.70	46.20	-31.30	85.44
LMf-Rmef	F	59.70	46.00	-39.20	84.95	58.70	46.20	-39.50	84.50	59.40	46.20	-39.70	85.08

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.87	107.05		1.88	107.60		1.87	106.88
b	BCF	1.92	110.11		1.91	109.32		1.91	109.52
c	CDE	1.26	72.23		1.27	72.55		1.26	72.39
d	ADF	1.23	70.59		1.23	70.49		1.24	71.17
Sum			359.98			359.97			359.96

T2 Average Angles		
Angles		Degrees
a		107.18
b		109.65
c		72.39
d		70.75
Sum		359.97

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	2.40
b	-1.89
c	1.31
d	-1.71

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.27	-48.50	-19.60
Landmark 2	Lmef	22.53	-47.30	-19.37
Landmark 3	RMf	-38.17	-20.10	-56.33
Landmark 4	LMf	40.60	-17.70	-57.00

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.10	0.35
Landmark 2	Lmef	0.21	0.20	0.21
Landmark 3	RMf	0.15	0.17	0.31
Landmark 4	LMf	0.20	0.26	0.26

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.30	-48.60	-19.80	-18.20	-48.50	-19.20	-18.30	-48.40	-19.80
Landmark 2	Lmef	22.70	-47.10	-19.20	22.30	-47.30	-19.30	22.60	-47.50	-19.60
Landmark 3	RMf	-38.00	-20.00	-56.60	-38.30	-20.00	-56.40	-38.20	-20.30	-56.00
Landmark 4	LMf	40.60	-17.60	-57.10	40.40	-18.00	-56.70	40.80	-17.50	-57.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.80	-1.20	-0.23	40.82
RMf to LMf	-78.77	-2.40	0.67	78.81
RMf to Rmef	-19.90	28.40	-36.73	50.52
LMf to Lmef	18.07	29.60	-37.63	51.17
RMf to Lmef	-60.70	27.20	-36.97	76.10
LMf to Rmef	58.87	30.80	-37.40	76.24

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-18.63	-52.07	-21.07
Landmark 2	Lmef	21.93	-50.50	-21.30
Landmark 3	RMf	-39.17	-22.30	-58.73
Landmark 4	LMf	41.70	-20.13	-58.40

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.32	0.15
Landmark 2	Lmef	0.06	0.10	0.10
Landmark 3	RMf	0.15	0.26	0.15
Landmark 4	LMf	0.17	0.31	0.17

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-18.50	-52.30	-21.20	-18.70	-52.20	-21.10	-18.70	-51.70	-20.90
Landmark 2	Lmef	21.90	-50.50	-21.40	22.00	-50.60	-21.30	21.90	-50.40	-21.20
Landmark 3	RMf	-39.20	-22.40	-58.70	-39.30	-22.50	-58.60	-39.00	-22.00	-58.90
Landmark 4	LMf	41.50	-20.40	-58.60	41.80	-19.80	-58.30	41.80	-20.20	-58.30

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.57	-1.57	0.23	40.60
RMf to LMf	-80.87	-2.17	-0.33	80.90
RMf to Rmef	-20.53	29.77	-37.67	52.22
LMf to Lmef	19.77	30.37	-37.10	51.86
RMf to Lmef	-61.10	28.20	-37.43	77.00
LMf to Rmef	60.33	31.93	-37.33	77.81

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.22
RMf to LMf	2.09
RMf to Rmef	1.70
LMf to Lmef	0.68
RMf to Lmef	0.91
LMf to Rmef	1.56

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.70	28.60	-36.80	50.60	-20.10	28.50	-37.20	50.99	-19.90	28.10	-36.20	49.96
RMef-LMef	B	-41.00	-1.50	-0.60	41.03	-40.50	-1.20	0.10	40.52	-40.90	-0.90	-0.20	40.91
LMf-Lmef	C	17.90	29.50	-37.90	51.25	18.10	29.30	-37.40	50.84	18.20	30.00	-37.60	51.43
RMf-LMf	D	-78.60	-2.40	0.50	78.64	-78.70	-2.00	0.30	78.73	-79.00	-2.80	1.20	79.06
RMf-Lmef	E	-60.70	27.10	-37.40	76.27	-60.60	27.30	-37.10	76.12	-60.80	27.20	-36.40	75.90
LMf-Rmef	F	58.90	31.00	-37.30	76.30	58.60	30.50	-37.50	75.96	59.10	30.90	-37.40	76.46

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.96	112.27	1.96	112.06	1.97	112.92
b	BCF	1.94	111.05	1.95	112.01	1.94	111.29
c	CDE	1.19	68.20	1.19	68.08	1.18	67.33
d	ADF	1.19	68.45	1.18	67.85	1.19	68.46
Sum		**359.98**		**360.00**		**360.00**	

T1 Average Angles	
Angles	Degrees
a	112.42
b	111.45
c	67.87
d	68.25
Sum	**359.99**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.70	29.90	-37.50	52.24	-20.60	29.70	-37.50	52.08	-20.30	29.70	-38.00	52.33
RMef-LMef	B	-40.40	-1.80	0.20	40.44	-40.70	-1.60	0.20	40.73	-40.60	-1.30	0.30	40.62
LMf-Lmef	C	19.60	30.10	-37.20	51.71	19.80	30.80	-37.00	52.05	19.90	30.20	-37.10	51.81
RMf-LMf	D	-80.70	-2.00	-0.10	80.72	-81.10	-2.70	-0.30	81.15	-80.80	-1.80	-0.60	80.82
RMf-Lmef	E	-61.10	28.10	-37.30	76.90	-61.30	28.10	-37.30	77.06	-60.90	28.40	-37.70	77.05
LMf-Rmef	F	60.00	31.90	-37.40	77.57	60.50	32.40	-37.20	78.06	60.50	31.50	-37.40	77.79

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.52		1.95	111.67		1.94	111.36
b	BCF	1.99	114.09		1.99	114.00		1.99	114.07
c	CDE	1.17	66.89		1.16	66.60		1.17	66.94
d	ADF	1.18	67.49		1.18	67.73		1.18	67.63
Sum			359.99			360.00			360.00

T2 Average Angles		
Angles		Degrees
a		111.52
b		114.05
c		66.81
d		67.62
Sum		360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.90
b	2.60
c	-1.06
d	-0.64

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-17.57	-44.67	-21.30
Landmark 2	Lmef	24.63	-41.60	-18.83
Landmark 3	RMf	-37.33	-17.57	-56.17
Landmark 4	LMf	43.50	-14.37	-54.37

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.06	0.00
Landmark 2	Lmef	0.06	0.10	0.21
Landmark 3	RMf	0.32	0.06	0.06
Landmark 4	LMf	0.10	0.15	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-17.50	-44.60	-21.30	-17.60	-44.70	-21.30	-17.60	-44.70	-21.30
Landmark 2	Lmef	24.60	-41.70	-19.00	24.60	-41.50	-18.90	24.70	-41.60	-18.60
Landmark 3	RMf	-37.70	-17.60	-56.20	-37.10	-17.50	-56.10	-37.20	-17.60	-56.20
Landmark 4	LMf	43.40	-14.50	-54.40	43.60	-14.20	-54.50	43.50	-14.40	-54.20

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.20	-3.07	-2.47	42.38
RMf to LMf	-80.83	-3.20	-1.80	80.92
RMf to Rmef	-19.77	27.10	-34.87	48.38
LMf to Lmef	18.87	27.23	-35.53	48.58
RMf to Lmef	-61.97	24.03	-37.33	76.23
LMf to Rmef	61.07	30.30	-33.07	75.77

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-15.17	-47.43	-14.03
Landmark 2	Lmef	27.73	-44.27	-10.83
Landmark 3	RMf	-38.03	-17.23	-51.87
Landmark 4	LMf	49.87	-12.13	-50.33

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.12	0.06
Landmark 2	Lmef	0.12	0.12	0.06
Landmark 3	RMf	0.31	0.23	0.35
Landmark 4	LMf	0.12	0.31	0.25

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-15.40	-47.30	-14.00	-15.10	-47.50	-14.00	-15.00	-47.50	-14.10
Landmark 2	Lmef	27.80	-44.20	-10.80	27.80	-44.20	-10.80	27.60	-44.40	-10.90
Landmark 3	RMf	-38.30	-17.10	-51.50	-38.10	-17.10	-51.90	-37.70	-17.50	-52.20
Landmark 4	LMf	49.80	-11.80	-50.30	49.80	-12.20	-50.60	50.00	-12.40	-50.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.90	-3.17	-3.20	43.14
RMf to LMf	-87.90	-5.10	-1.53	88.06
RMf to Rmef	-22.87	30.20	-37.83	53.54
LMf to Lmef	22.13	32.13	-39.50	55.52
RMf to Lmef	-65.77	27.03	-41.03	82.10
LMf to Rmef	65.03	35.30	-36.30	82.42

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.75
RMf to LMf	7.14
RMf to Rmef	5.16
LMf to Lmef	6.94
RMf to Lmef	5.86
LMf to Rmef	6.65

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.20	27.00	-34.90	48.53	-19.50	27.20	-34.80	48.28	-19.60	27.10	-34.90	48.34
RMef-LMef	B	-42.10	-2.90	-2.30	42.26	-42.20	-3.20	-2.40	42.39	-42.30	-3.10	-2.70	42.50
LMf-Lmef	C	18.80	27.20	-35.40	48.44	19.00	27.30	-35.60	48.72	18.80	27.20	-35.60	48.59
RMf-LMf	D	-81.10	-3.10	-1.80	81.18	-80.70	-3.30	-1.60	80.78	-80.70	-3.20	-2.00	80.79
RMf-Lmef	E	-62.30	24.10	-37.20	76.46	-61.70	24.00	-37.20	75.94	-61.90	24.00	-37.60	76.30
LMf-Rmef	F	60.90	30.10	-33.10	75.57	61.20	30.50	-33.20	76.01	61.10	30.30	-32.90	75.72

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	2.00	114.56	1.98	113.60	1.99	114.11
b	BCF	1.97	112.67	1.97	112.90	1.96	112.30
c	CDE	1.17	66.86	1.16	66.55	1.17	67.01
d	ADF	1.15	65.76	1.17	66.75	1.16	66.38
Sum			**359.85**		**359.80**		**359.80**

T1 Average Angles	
Angles	Degrees
a	114.09
b	112.62
c	66.81
d	66.30
Sum	**359.82**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-22.90	30.20	-37.50	53.32	-23.00	30.40	-37.90	53.75	-22.70	30.00	-38.10	53.54
RMef-LMef	B	-43.20	-3.10	-3.20	43.43	-42.90	-3.30	-3.20	43.15	-42.60	-3.10	-3.20	42.83
LMf-Lmef	C	22.00	32.40	-39.50	55.62	22.00	32.00	-39.80	55.61	22.40	32.00	-39.20	55.34
RMf-LMf	D	-88.10	-5.30	-1.20	88.27	-87.90	-4.90	-1.30	88.05	-87.70	-5.10	-2.10	87.87
RMf-Lmef	E	-66.10	27.10	-40.70	82.22	-65.90	27.10	-41.10	82.26	-65.30	26.90	-41.30	81.81
LMf-Rmef	F	65.20	35.50	-36.30	82.64	64.90	35.30	-36.60	82.45	65.00	35.10	-36.00	82.18

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	2.02	116.02		2.02	115.75		2.02	115.74
b	BCF	1.96	112.50		1.97	112.60		1.97	113.05
c	CDE	1.14	65.16		1.14	65.39		1.14	65.13
d	ADF	1.15	66.16		1.15	66.04		1.15	65.95
Sum			359.83			359.78			359.86

T2 Average Angles		
Angles		Degrees
a		115.84
b		112.72
c		65.23
d		66.05
Sum		359.83

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.75
b	0.09
c	-1.58
d	-0.25

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-16.50	-53.40	-17.03
Landmark 2	Lmef	22.03	-51.70	-18.37
Landmark 3	RMf	-36.03	-23.77	-54.47
Landmark 4	LMf	38.37	-23.80	-56.00

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.10	0.06
Landmark 2	Lmef	0.06	0.10	0.12
Landmark 3	RMf	0.21	0.15	0.15
Landmark 4	LMf	0.06	0.36	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.60	-53.30	-17.00	-16.50	-53.40	-17.00	-16.40	-53.50	-17.10
Landmark 2	Lmef	22.00	-51.80	-18.50	22.00	-51.60	-18.30	22.10	-51.70	-18.30
Landmark 3	RMf	-36.20	-23.60	-54.50	-36.10	-23.90	-54.30	-35.80	-23.80	-54.60
Landmark 4	LMf	38.40	-23.50	-56.10	38.30	-24.20	-55.90	38.40	-23.70	-56.00

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-38.53	-1.70	1.33	38.59
RMf to LMf	-74.40	0.03	1.53	74.42
RMf to Rmef	-19.53	29.63	-37.43	51.58
LMf to Lmef	16.33	27.90	-37.63	49.61
RMf to Lmef	-58.07	27.93	-36.10	73.86
LMf to Rmef	54.87	29.60	-38.97	73.52

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-16.53	-54.20	-14.00
Landmark 2	Lmef	24.13	-51.70	-14.50
Landmark 3	RMf	-37.80	-23.90	-57.03
Landmark 4	LMf	42.43	-23.90	-56.70

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.10	0.10
Landmark 2	Lmef	0.06	0.10	0.00
Landmark 3	RMf	0.17	0.10	0.06
Landmark 4	LMf	0.15	0.26	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-16.50	-54.30	-14.00	-16.60	-54.10	-13.90	-16.50	-54.20	-14.10
Landmark 2	Lmef	24.20	-51.70	-14.50	24.10	-51.80	-14.50	24.10	-51.60	-14.50
Landmark 3	RMf	-37.90	-24.00	-57.00	-37.60	-23.80	-57.00	-37.90	-23.90	-57.10
Landmark 4	LMf	42.40	-24.00	-56.70	42.30	-24.10	-56.50	42.60	-23.60	-56.90

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.67	-2.50	0.50	40.75
RMf to LMf	-80.23	0.00	-0.33	80.23
RMf to Rmef	-21.27	30.30	-43.03	56.76
LMf to Lmef	18.30	27.80	-42.20	53.75
RMf to Lmef	-61.93	27.80	-42.53	80.11
LMf to Rmef	58.97	30.30	-42.70	78.86

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	2.15
RMf to LMf	5.82
RMf to Rmef	5.18
LMf to Lmef	4.13
RMf to Lmef	6.25
LMf to Rmef	5.34

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.60	29.70	-37.50	51.70	-19.60	29.50	-37.30	51.44	-19.40	29.70	-37.50	51.62
RMef-LMef	B	-38.60	-1.50	1.50	38.66	-38.50	-1.80	1.30	38.56	-38.50	-1.80	1.20	38.56
LMf-Lmef	C	16.40	28.30	-37.60	49.84	16.30	27.40	-37.60	49.30	16.30	28.00	-37.70	49.71
RMf-LMf	D	-74.60	-0.10	1.60	74.62	-74.40	0.30	1.60	74.42	-74.20	-0.10	1.40	74.21
RMf-Lmef	E	-58.20	28.20	-36.00	74.02	-58.10	27.70	-36.00	73.75	-57.90	27.90	-36.30	73.81
LMf-Rmef	F	55.00	29.80	-39.10	73.77	54.80	29.20	-38.90	73.27	54.80	29.80	-38.90	73.51

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.91	109.16	1.91	109.22	1.90	109.01
b	BCF	1.96	112.33	1.96	112.44	1.96	112.17
c	CDE	1.22	69.76	1.22	69.83	1.22	69.95
d	ADF	1.20	68.73	1.19	68.43	1.20	68.82
Sum			359.98		359.93		359.94

T1 Average Angles	
Angles	Degrees
a	109.13
b	112.31
c	69.85
d	68.66
Sum	359.95

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.40	30.30	-43.00	56.79	-21.00	30.30	-43.10	56.72	-21.40	30.30	-43.00	56.79
RMef-LMef	B	-40.70	-2.60	0.50	40.79	-40.70	-2.30	0.60	40.77	-40.60	-2.60	0.40	40.69
LMf-Lmef	C	18.20	27.70	-42.20	53.66	18.20	27.70	-42.00	53.50	18.50	28.00	-42.40	54.07
RMf-LMf	D	-80.30	0.00	-0.30	80.30	-79.90	0.30	-0.50	79.90	-80.50	-0.30	-0.20	80.50
RMf-Lmef	E	-62.10	27.70	-42.50	80.19	-61.70	28.00	-42.50	79.98	-62.00	27.70	-42.60	80.16
LMf-Rmef	F	58.90	30.30	-42.70	78.81	58.90	30.00	-42.60	78.64	59.10	30.60	-42.80	79.13

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.44		1.91	109.17		1.91	109.54
b	BCF	1.96	112.40		1.96	112.36		1.96	112.47
c	CDE	1.23	70.35		1.23	70.53		1.22	70.00
d	ADF	1.18	67.69		1.18	67.85		1.18	67.87
Sum			359.87			359.90			359.88

T2 Average Angles	
Angles	Degrees
a	109.38
b	112.41
c	70.29
d	67.80
Sum	359.88

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.25
b	0.10
c	0.45
d	-0.86

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.87	-49.90	-24.20
Landmark 2	Lmef	19.50	-48.13	-24.57
Landmark 3	RMf	-40.80	-21.63	-59.60
Landmark 4	LMf	36.57	-19.27	-61.40

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.17	0.10
Landmark 2	Lmef	0.10	0.06	0.06
Landmark 3	RMf	0.10	0.15	0.10
Landmark 4	LMf	0.12	0.15	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-22.00	-49.70	-24.10	-21.80	-50.00	-24.30	-21.80	-50.00	-24.20
Landmark 2	Lmef	19.50	-48.10	-24.60	19.60	-48.20	-24.60	19.40	-48.10	-24.50
Landmark 3	RMf	-40.70	-21.80	-59.70	-40.90	-21.60	-59.50	-40.80	-21.50	-59.60
Landmark 4	LMf	36.50	-19.40	-61.30	36.70	-19.30	-61.40	36.50	-19.10	-61.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.37	-1.77	0.37	41.41
RMf to LMf	-77.37	-2.37	1.80	77.42
RMf to Rmef	-18.93	28.27	-35.40	49.10
LMf to Lmef	17.07	28.87	-36.83	49.81
RMf to Lmef	-60.30	26.50	-35.03	74.60
LMf to Rmef	58.43	30.63	-37.20	75.74

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-23.37	-55.87	-15.63
Landmark 2	Lmef	18.07	-54.10	-15.03
Landmark 3	RMf	-43.53	-25.73	-55.07
Landmark 4	LMf	37.23	-22.73	-55.33

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.06	0.06
Landmark 2	Lmef	0.15	0.17	0.12
Landmark 3	RMf	0.06	0.23	0.15
Landmark 4	LMf	0.15	0.15	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.40	-55.90	-15.60	-23.30	-55.80	-15.60	-23.40	-55.90	-15.70
Landmark 2	Lmef	18.20	-54.00	-14.90	17.90	-54.30	-15.10	18.10	-54.00	-15.10
Landmark 3	RMf	-43.50	-26.00	-54.90	-43.50	-25.60	-55.20	-43.60	-25.60	-55.10
Landmark 4	LMf	37.20	-22.60	-55.40	37.10	-22.90	-55.40	37.40	-22.70	-55.20

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.43	-1.77	-0.60	41.48
RMf to LMf	-80.77	-3.00	0.27	80.82
RMf to Rmef	-20.17	30.13	-39.43	53.57
LMf to Lmef	19.17	31.37	-40.30	54.55
RMf to Lmef	-61.60	28.37	-40.03	78.75
LMf to Rmef	60.60	33.13	-39.70	79.66

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.07
RMf to LMf	3.40
RMf to Rmef	4.47
LMf to Lmef	4.73
RMf to Lmef	4.15
LMf to Rmef	3.92

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.70	27.90	-35.60	48.94	-19.10	28.40	-35.20	49.10	-19.00	28.50	-35.40	49.26
RMef-LMef	B	-41.50	-1.60	0.50	41.53	-41.40	-1.80	0.30	41.44	-41.20	-1.90	0.30	41.24
LMf-Lmef	C	17.00	28.70	-36.70	49.59	17.10	28.90	-36.80	49.82	17.10	29.00	-37.00	50.02
RMf-LMf	D	-77.20	-2.40	1.60	77.25	-77.60	-2.30	1.90	77.66	-77.30	-2.40	1.90	77.36
RMf-Lmef	E	-60.20	26.30	-35.10	74.48	-60.50	26.60	-34.90	74.74	-60.20	26.60	-35.10	74.59
LMf-Rmef	F	58.50	30.30	-37.20	75.66	58.50	30.70	-37.10	75.77	58.30	30.90	-37.30	75.80

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.93	110.55	1.94	111.00	1.93	110.70
b	BCF	1.95	111.94	1.95	111.93	1.95	111.93
c	CDE	1.19	67.92	1.18	67.77	1.18	67.81
d	ADF	1.21	69.57	1.21	69.26	1.21	69.52
Sum			**359.99**		**359.97**		**359.96**

T1 Average Angles	
Angles	Degrees
a	110.75
b	111.94
c	67.84
d	69.45
Sum	**359.97**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.10	29.90	-39.30	53.32	-20.20	30.20	-39.60	53.74	-20.20	30.30	-39.40	53.65
RMef-LMef	B	-41.60	-1.90	-0.70	41.65	-41.20	-1.50	-0.50	41.23	-41.50	-1.90	-0.60	41.55
LMf-Lmef	C	19.00	31.40	-40.50	54.66	19.20	31.40	-40.30	54.58	19.30	31.30	-40.10	54.41
RMf-LMf	D	-80.70	-3.40	0.50	80.77	-80.60	-2.70	0.20	80.65	-81.00	-2.90	0.10	81.05
RMf-Lmef	E	-61.70	28.00	-40.00	78.68	-61.40	28.70	-40.10	78.75	-61.70	28.40	-40.00	78.83
LMf-Rmef	F	60.60	33.30	-39.80	79.78	60.40	32.90	-39.80	79.46	60.80	33.20	-39.50	79.74

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.94	111.31		1.94	111.35		1.94	111.15
b	BCF	1.94	111.16		1.94	111.32		1.95	111.71
c	CDE	1.19	67.91		1.19	68.12		1.19	67.91
d	ADF	1.21	69.60		1.21	69.21		1.21	69.20
Sum			359.98			359.99			359.98

T2 Average Angles		
Angles		Degrees
a		111.27
b		111.40
c		67.98
d		69.34
Sum		359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.52
b	-0.54
c	0.15
d	-0.12

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-23.03	-49.47	-16.33
Landmark 2	Lmef	18.17	-49.43	-17.83
Landmark 3	RMf	-41.23	-15.67	-50.07
Landmark 4	LMf	34.57	-14.40	-51.60

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.21	0.15	0.06
Landmark 2	Lmef	0.12	0.15	0.15
Landmark 3	RMf	0.23	0.12	0.12
Landmark 4	LMf	0.06	0.10	0.17

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.10	-49.30	-16.30	-23.20	-49.60	-16.30	-22.80	-49.50	-16.40
Landmark 2	Lmef	18.30	-49.30	-17.70	18.10	-49.60	-17.80	18.10	-49.40	-18.00
Landmark 3	RMf	-41.50	-15.80	-50.00	-41.10	-15.60	-50.20	-41.10	-15.60	-50.00
Landmark 4	LMf	34.60	-14.30	-51.70	34.60	-14.40	-51.70	34.50	-14.50	-51.40

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.20	-0.03	1.50	41.23
RMf to LMf	-75.80	-1.27	1.53	75.83
RMf to Rmef	-18.20	33.80	-33.73	51.10
LMf to Lmef	16.40	35.03	-33.77	51.35
RMf to Lmef	-59.40	33.77	-32.23	75.55
LMf to Rmef	57.60	35.07	-35.27	76.10

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.07	-56.20	-13.33
Landmark 2	Lmef	19.73	-55.67	-14.50
Landmark 3	RMf	-41.30	-19.43	-50.37
Landmark 4	LMf	38.70	-16.70	-51.13

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.25	0.20	0.06
Landmark 2	Lmef	0.15	0.15	0.00
Landmark 3	RMf	0.10	0.31	0.12
Landmark 4	LMf	0.17	0.10	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-20.80	-56.40	-13.40	-21.30	-56.20	-13.30	-21.10	-56.00	-13.30
Landmark 2	Lmef	19.60	-55.80	-14.50	19.90	-55.50	-14.50	19.70	-55.70	-14.50
Landmark 3	RMf	-41.20	-19.50	-50.30	-41.40	-19.10	-50.50	-41.30	-19.70	-50.30
Landmark 4	LMf	38.90	-16.60	-51.10	38.60	-16.80	-51.20	38.60	-16.70	-51.10

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.80	-0.53	1.17	40.82
RMf to LMf	-80.00	-2.73	0.77	80.05
RMf to Rmef	-20.23	36.77	-37.03	55.97
LMf to Lmef	18.97	38.97	-36.63	56.75
RMf to Lmef	-61.03	36.23	-35.87	79.53
LMf to Rmef	59.77	39.50	-37.80	81.00

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.41
RMf to LMf	4.22
RMf to Rmef	4.87
LMf to Lmef	5.40
RMf to Lmef	3.98
LMf to Rmef	4.90

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.40	33.50	-33.70	50.96	-17.90	34.00	-33.90	51.24	-18.30	33.90	-33.60	51.12
RMef-LMef	B	-41.40	0.00	1.40	41.42	-41.30	0.00	1.50	41.33	-40.90	-0.10	1.60	40.93
LMf-Lmef	C	16.30	35.00	-34.00	51.45	16.50	35.20	-33.90	51.58	16.40	34.90	-33.40	51.01
RMf-LMf	D	-76.10	-1.50	1.70	76.13	-75.70	-1.20	1.50	75.72	-75.60	-1.10	1.40	75.62
RMf-Lmef	E	-59.80	33.50	-32.30	75.77	-59.20	34.00	-32.40	75.57	-59.20	33.80	-32.00	75.31
LMf-Rmef	F	57.70	35.00	-35.40	76.21	57.80	35.20	-35.40	76.37	57.30	35.00	-35.00	75.72

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.92	109.79	1.90	108.97	1.91	109.29
b	BCF	1.92	109.82	1.92	110.09	1.93	110.40
c	CDE	1.22	69.83	1.22	69.90	1.22	69.91
d	ADF	1.23	70.54	1.24	71.00	1.23	70.36
Sum			**359.97**		**359.96**		**359.96**

T1 Average Angles	
Angles	Degrees
a	109.35
b	110.10
c	69.88
d	70.63
Sum	**359.96**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.40	36.90	-36.90	56.03	-20.10	37.10	-37.20	56.25	-20.20	36.30	-37.00	55.63
RMef-LMef	B	-40.40	-0.60	1.10	40.42	-41.20	-0.70	1.20	41.22	-40.80	-0.30	1.20	40.82
LMf-Lmef	C	19.30	39.20	-36.60	57.00	18.70	38.70	-36.70	56.52	18.90	39.00	-36.60	56.73
RMf-LMf	D	-80.10	-2.90	0.80	80.16	-80.00	-2.30	0.70	80.04	-79.90	-3.00	0.80	79.96
RMf-Lmef	E	-60.80	36.30	-35.80	79.35	-61.30	36.40	-36.00	79.87	-61.00	36.00	-35.80	79.36
LMf-Rmef	F	59.70	39.80	-37.70	81.05	59.90	39.40	-37.90	81.10	59.70	39.30	-37.80	80.85

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.91	109.65		1.90	109.07		1.92	109.79
b	BCF	1.95	111.48		1.94	111.17		1.94	110.92
c	CDE	1.19	68.31		1.21	69.14		1.20	68.58
d	ADF	1.23	70.52		1.23	70.58		1.23	70.63
Sum			359.95			359.97			359.92

T2 Average Angles	
Angles	Degrees
a	109.50
b	111.19
c	68.68
d	70.58
Sum	359.95

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.15
b	1.09
c	-1.20
d	-0.05

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-22.90	-47.67	-14.53
Landmark 2	Lmef	17.67	-45.03	-15.73
Landmark 3	RMf	-41.33	-12.87	-56.40
Landmark 4	LMf	35.07	-14.60	-56.60

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.17	0.06	0.12
Landmark 2	Lmef	0.12	0.06	0.06
Landmark 3	RMf	0.06	0.32	0.20
Landmark 4	LMf	0.12	0.36	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-23.00	-47.70	-14.40	-22.70	-47.70	-14.60	-23.00	-47.60	-14.60
Landmark 2	Lmef	17.60	-45.00	-15.70	17.60	-45.10	-15.80	17.80	-45.00	-15.70
Landmark 3	RMf	-41.40	-13.00	-56.40	-41.30	-13.10	-56.20	-41.30	-12.50	-56.60
Landmark 4	LMf	35.00	-15.00	-56.40	35.20	-14.30	-56.80	35.00	-14.50	-56.60

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.57	-2.63	1.20	40.67
RMf to LMf	-76.40	1.73	0.20	76.42
RMf to Rmef	-18.43	34.80	-41.87	57.48
LMf to Lmef	17.40	30.43	-40.87	53.84
RMf to Lmef	-59.00	32.17	-40.67	78.55
LMf to Rmef	57.97	33.07	-42.07	78.89

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-24.13	-46.67	-9.37
Landmark 2	Lmef	16.07	-44.83	-11.13
Landmark 3	RMf	-43.53	-11.63	-53.30
Landmark 4	LMf	34.33	-14.80	-54.73

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.12	0.06
Landmark 2	Lmef	0.06	0.06	0.06
Landmark 3	RMf	0.15	0.15	0.10
Landmark 4	LMf	0.12	0.26	0.25

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-24.20	-46.60	-9.40	-24.10	-46.60	-9.40	-24.10	-46.80	-9.30
Landmark 2	Lmef	16.00	-44.80	-11.10	16.10	-44.80	-11.10	16.10	-44.90	-11.20
Landmark 3	RMf	-43.50	-11.60	-53.20	-43.40	-11.50	-53.40	-43.70	-11.80	-53.30
Landmark 4	LMf	34.40	-14.50	-55.00	34.40	-15.00	-54.70	34.20	-14.90	-54.50

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-40.20	-1.83	1.77	40.28
RMf to LMf	-77.87	3.17	1.43	77.94
RMf to Rmef	-19.40	35.03	-43.93	59.45
LMf to Lmef	18.27	30.03	-43.60	56.01
RMf to Lmef	-59.60	33.20	-42.17	80.20
LMf to Rmef	58.47	31.87	-45.37	80.57

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.39
RMf to LMf	1.52
RMf to Rmef	1.97
LMf to Lmef	2.16
RMf to Lmef	1.66
LMf to Rmef	1.69

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.40	34.70	-42.00	57.50	-18.60	34.60	-41.60	57.22	-18.30	35.10	-42.00	57.71
RMef-LMef	B	-40.60	-2.70	1.30	40.71	-40.30	-2.60	1.20	40.40	-40.80	-2.60	1.10	40.90
LMf-Lmef	C	17.40	30.00	-40.70	53.47	17.60	30.80	-41.00	54.22	17.20	30.50	-40.90	53.84
RMf-LMf	D	-76.40	2.00	0.00	76.43	-76.50	1.20	0.60	76.51	-76.30	2.00	0.00	76.33
RMf-Lmef	E	-59.00	32.00	-40.70	78.50	-58.90	32.00	-40.40	78.26	-59.10	32.50	-40.90	78.88
LMf-Rmef	F	58.00	32.70	-42.00	78.72	57.90	33.40	-42.20	79.05	58.00	33.10	-42.00	78.89

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.83	104.82	1.84	105.29	1.83	104.96
b	BCF	1.97	112.71	1.96	112.51	1.96	112.03
c	CDE	1.25	71.90	1.24	71.24	1.26	72.27
d	ADF	1.23	70.39	1.24	70.80	1.23	70.55
Sum		359.82		359.85		359.82	

T1 Average Angles	
Angles	Degrees
a	105.02
b	112.42
c	71.81
d	70.58
Sum	359.83

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.30	35.00	-43.80	59.30	-19.30	35.10	-44.00	59.50	-19.60	35.00	-44.00	59.54
RMef-LMef	B	-40.20	-1.80	1.70	40.28	-40.20	-1.80	1.70	40.28	-40.20	-1.90	1.90	40.29
LMf-Lmef	C	18.40	30.30	-43.90	56.43	18.30	29.80	-43.60	55.89	18.10	30.00	-43.30	55.70
RMf-LMf	D	-77.90	2.90	1.80	77.97	-77.80	3.50	1.30	77.89	-77.90	3.10	1.20	77.97
RMf-Lmef	E	-59.50	33.20	-42.10	80.09	-59.50	33.30	-42.30	80.24	-59.80	33.10	-42.10	80.27
LMf-Rmef	F	58.60	32.10	-45.60	80.89	58.50	31.60	-45.30	80.45	58.30	31.90	-45.20	80.37

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.84	105.50		1.84	105.44		1.84	105.42
b	BCF	1.96	112.48		1.96	112.55		1.97	112.72
c	CDE	1.24	71.11		1.25	71.57		1.25	71.63
d	ADF	1.23	70.73		1.23	70.24		1.22	70.07
Sum			359.82			359.80			359.84

T2 Average Angles		
Angles		Degrees
a		105.45
b		112.58
c		71.44
d		70.34
Sum		359.82

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.43
b	0.17
c	-0.37
d	-0.24

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-15.40	-46.37	-21.27
Landmark 2	Lmef	25.83	-44.73	-24.07
Landmark 3	RMf	-35.93	-18.03	-53.43
Landmark 4	LMf	36.43	-14.60	-58.70

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.12	0.12
Landmark 2	Lmef	0.06	0.21	0.15
Landmark 3	RMf	0.06	0.21	0.06
Landmark 4	LMf	0.15	0.17	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-15.40	-46.50	-21.40	-15.50	-46.30	-21.20	-15.30	-46.30	-21.20
Landmark 2	Lmef	25.90	-44.80	-24.20	25.80	-44.90	-24.10	25.80	-44.50	-23.90
Landmark 3	RMf	-36.00	-17.80	-53.50	-35.90	-18.20	-53.40	-35.90	-18.10	-53.40
Landmark 4	LMf	36.60	-14.40	-58.70	36.30	-14.70	-58.90	36.40	-14.70	-58.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.23	-1.63	2.80	41.36
RMf to LMf	-72.37	-3.43	5.27	72.64
RMf to Rmef	-20.53	28.33	-32.17	47.53
LMf to Lmef	10.60	30.13	-34.63	47.12
RMf to Lmef	-61.77	26.70	-29.37	73.42
LMf to Rmef	51.83	31.77	-37.43	71.39

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-15.43	-50.37	-22.47
Landmark 2	Lmef	25.83	-48.67	-23.33
Landmark 3	RMf	-36.43	-19.57	-57.70
Landmark 4	LMf	40.23	-16.63	-59.90

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.15	0.06
Landmark 2	Lmef	0.15	0.12	0.15
Landmark 3	RMf	0.15	0.12	0.17
Landmark 4	LMf	0.15	0.06	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-15.40	-50.50	-22.50	-15.50	-50.40	-22.50	-15.40	-50.20	-22.40
Landmark 2	Lmef	26.00	-48.60	-23.20	25.80	-48.80	-23.30	25.70	-48.60	-23.50
Landmark 3	RMf	-36.60	-19.70	-57.90	-36.40	-19.50	-57.60	-36.30	-19.50	-57.60
Landmark 4	LMf	40.40	-16.60	-60.00	40.20	-16.70	-59.80	40.10	-16.60	-59.90

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.27	-1.70	0.87	41.31
RMf to LMf	-76.67	-2.93	2.20	76.75
RMf to Rmef	-21.00	30.80	-35.23	51.29
LMf to Lmef	14.40	32.03	-36.57	50.70
RMf to Lmef	-62.27	29.10	-34.37	76.84
LMf to Rmef	55.67	33.73	-37.43	75.09

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	-0.05
RMf to LMf	4.12
RMf to Rmef	3.76
LMf to Lmef	3.59
RMf to Lmef	3.42
LMf to Rmef	3.69

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.60	28.70	-32.10	47.73	-20.40	28.10	-32.20	47.36	-20.60	28.20	-32.20	47.50
RMef-LMef	B	-41.30	-1.70	2.80	41.43	-41.30	-1.40	2.90	41.43	-41.10	-1.80	2.70	41.23
LMf-Lmef	C	10.70	30.40	-34.50	47.21	10.50	30.20	-34.80	47.26	10.60	29.80	-34.60	46.88
RMf-LMf	D	-72.60	-3.40	5.20	72.87	-72.20	-3.50	5.50	72.49	-72.30	-3.40	5.10	72.56
RMf-Lmef	E	-61.90	27.00	-29.30	73.61	-61.70	26.70	-29.30	73.34	-61.70	26.40	-29.50	73.31
LMf-Rmef	F	52.00	32.10	-37.30	71.59	51.80	31.60	-37.70	71.44	51.70	31.60	-37.30	71.15

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.94	111.11	1.94	111.21	1.94	111.22
b	BCF	1.88	107.56	1.87	107.14	1.88	107.55
c	CDE	1.26	72.06	1.26	72.06	1.26	72.12
d	ADF	1.21	69.27	1.21	69.59	1.21	69.11
Sum			360.00		360.00		360.00

T1 Average Angles	
Angles	Degrees
a	111.18
b	107.42
c	72.08
d	69.32
Sum	360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-21.20	30.80	-35.40	51.49	-20.90	30.90	-35.10	51.22	-20.90	30.70	-35.20	51.17
RMef-LMef	B	-41.40	-1.90	0.70	41.45	-41.30	-1.60	0.80	41.34	-41.10	-1.60	1.10	41.15
LMf-Lmef	C	14.40	32.00	-36.80	50.85	14.40	32.10	-36.50	50.70	14.40	32.00	-36.40	50.56
RMf-LMf	D	-77.00	-3.10	2.10	77.09	-76.60	-2.80	2.20	76.68	-76.40	-2.90	2.30	76.49
RMf-Lmef	E	-62.60	28.90	-34.70	77.19	-62.20	29.30	-34.30	76.84	-62.00	29.10	-34.10	76.51
LMf-Rmef	F	55.80	33.90	-37.50	75.29	55.70	33.70	-37.30	75.03	55.50	33.60	-37.50	74.94

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.95	111.85		1.95	111.78		1.95	111.49
b	BCF	1.90	108.90		1.90	108.80		1.91	109.17
c	CDE	1.24	70.86		1.24	70.88		1.23	70.72
d	ADF	1.19	68.38		1.20	68.54		1.20	68.62
Sum			359.99			360.00			360.00

T2 Average Angles		
Angles		Degrees
a		111.71
b		108.96
c		70.82
d		68.51
Sum		360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.53
b	1.54
c	-1.26
d	-0.81

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.20	-48.10	-19.57
Landmark 2	Lmef	23.63	-45.80	-18.90
Landmark 3	RMf	-35.90	-15.70	-56.67
Landmark 4	LMf	41.27	-12.47	-56.23

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.10	0.15
Landmark 2	Lmef	0.06	0.00	0.10
Landmark 3	RMf	0.00	0.20	0.06
Landmark 4	LMf	0.21	0.12	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.10	-48.20	-19.40	-19.20	-48.00	-19.60	-19.30	-48.10	-19.70
Landmark 2	Lmef	23.60	-45.80	-18.90	23.70	-45.80	-18.80	23.60	-45.80	-19.00
Landmark 3	RMf	-35.90	-15.50	-56.70	-35.90	-15.90	-56.60	-35.90	-15.70	-56.70
Landmark 4	LMf	41.10	-12.40	-56.40	41.50	-12.40	-56.20	41.20	-12.60	-56.10

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.83	-2.30	-0.67	42.90
RMf to LMf	-77.17	-3.23	-0.43	77.24
RMf to Rmef	-16.70	32.40	-37.10	52.01
LMf to Lmef	17.63	33.33	-37.33	53.06
RMf to Lmef	-59.53	30.10	-37.77	76.66
LMf to Rmef	60.47	35.63	-36.67	79.19

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-19.87	-51.30	-14.20
Landmark 2	Lmef	23.10	-49.80	-12.93
Landmark 3	RMf	-38.27	-17.90	-57.27
Landmark 4	LMf	44.60	-15.23	-55.27

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.15	0.10	0.10
Landmark 2	Lmef	0.10	0.00	0.06
Landmark 3	RMf	0.15	0.00	0.06
Landmark 4	LMf	0.17	0.15	0.12

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-19.90	-51.30	-14.30	-20.00	-51.20	-14.10	-19.70	-51.40	-14.20
Landmark 2	Lmef	23.20	-49.80	-12.90	23.10	-49.80	-12.90	23.00	-49.80	-13.00
Landmark 3	RMf	-38.40	-17.90	-57.20	-38.30	-17.90	-57.30	-38.10	-17.90	-57.30
Landmark 4	LMf	44.40	-15.40	-55.20	44.70	-15.10	-55.40	44.70	-15.20	-55.20

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.97	-1.50	-1.27	43.01
RMf to LMf	-82.87	-2.67	-2.00	82.93
RMf to Rmef	-18.40	33.40	-43.07	57.52
LMf to Lmef	21.50	34.57	-42.33	58.73
RMf to Lmef	-61.37	31.90	-44.33	82.15
LMf to Rmef	64.47	36.07	-41.07	84.52

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.11
RMf to LMf	5.70
RMf to Rmef	5.51
LMf to Lmef	5.67
RMf to Lmef	5.49
LMf to Rmef	5.33

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.80	32.70	-37.30	52.37	-16.70	32.10	-37.00	51.75	-16.60	32.40	-37.00	51.91
RMef-LMef	B	-42.70	-2.40	-0.50	42.77	-42.90	-2.20	-0.80	42.96	-42.90	-2.30	-0.70	42.97
LMf-Lmef	C	17.50	33.40	-37.50	53.18	17.80	33.40	-37.40	53.21	17.60	33.20	-37.10	52.81
RMf-LMf	D	-77.00	-3.10	-0.30	77.06	-77.40	-3.50	-0.40	77.48	-77.10	-3.10	-0.60	77.16
RMf-Lmef	E	-59.50	30.30	-37.80	76.73	-59.60	29.90	-37.80	76.65	-59.50	30.10	-37.70	76.60
LMf-Rmef	F	60.20	35.80	-37.00	79.21	60.70	35.60	-36.60	79.32	60.50	35.50	-36.40	79.03

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.87	107.07	1.88	107.68	1.87	107.31
b	BCF	1.93	110.83	1.93	110.68	1.93	110.79
c	CDE	1.21	69.43	1.20	68.97	1.21	69.34
d	ADF	1.27	72.65	1.27	72.66	1.27	72.54
Sum			359.98		359.99		359.98

T1 Average Angles	
Angles	Degrees
a	107.35
b	110.77
c	69.25
d	72.62
Sum	359.98

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.50	33.40	-42.90	57.43	-18.30	33.30	-43.20	57.53	-18.40	33.50	-43.10	57.61
RMef-LMef	B	-43.10	-1.50	-1.40	43.15	-43.10	-1.40	-1.20	43.14	-42.70	-1.60	-1.20	42.75
LMf-Lmef	C	21.20	34.40	-42.30	58.50	21.60	34.70	-42.50	58.97	21.70	34.60	-42.20	58.73
RMf-LMf	D	-82.80	-2.50	-2.00	82.86	-83.00	-2.80	-1.90	83.07	-82.80	-2.70	-2.10	82.87
RMf-Lmef	E	-61.60	31.90	-44.30	82.31	-61.40	31.90	-44.40	82.21	-61.10	31.90	-44.30	81.93
LMf-Rmef	F	64.30	35.90	-40.90	84.24	64.70	36.10	-41.30	84.82	64.40	36.20	-41.00	84.49

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.90	109.01		1.90	108.66		1.89	108.56
b	BCF	1.94	111.04		1.94	111.41		1.95	111.78
c	CDE	1.20	68.75		1.19	68.32		1.19	68.27
d	ADF	1.24	71.19		1.25	71.61		1.25	71.39
Sum			359.99			360.00			360.00

T2 Average Angles		
Angles		Degrees
a		108.74
b		111.41
c		68.45
d		71.40
Sum		360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	1.39
b	0.64
c	-0.80
d	-1.22

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.10	-50.67	-14.60
Landmark 2	Lmef	21.57	-48.43	-13.30
Landmark 3	RMf	-37.80	-20.50	-54.63
Landmark 4	LMf	37.97	-19.97	-52.93

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.06	0.10
Landmark 2	Lmef	0.23	0.21	0.10
Landmark 3	RMf	0.20	0.26	0.12
Landmark 4	LMf	0.06	0.32	0.32

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.00	-50.70	-14.60	-21.10	-50.60	-14.50	-21.20	-50.70	-14.70
Landmark 2	Lmef	21.70	-48.20	-13.20	21.70	-48.50	-13.30	21.30	-48.60	-13.40
Landmark 3	RMf	-37.80	-20.80	-54.70	-37.60	-20.40	-54.70	-38.00	-20.30	-54.50
Landmark 4	LMf	38.00	-19.60	-53.30	38.00	-20.20	-52.80	37.90	-20.10	-52.70

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.67	-2.23	-1.30	42.74
RMf to LMf	-75.77	-0.53	-1.70	75.79
RMf to Rmef	-16.70	30.17	-40.03	52.84
LMf to Lmef	16.40	28.47	-39.63	51.48
RMf to Lmef	-59.37	27.93	-41.33	77.54
LMf to Rmef	59.07	30.70	-38.33	76.82

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-22.30	-52.37	-15.07
Landmark 2	Lmef	21.70	-50.47	-14.67
Landmark 3	RMf	-40.47	-20.07	-55.93
Landmark 4	LMf	37.23	-21.33	-55.60

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.00	0.06	0.15
Landmark 2	Lmef	0.10	0.06	0.12
Landmark 3	RMf	0.06	0.15	0.12
Landmark 4	LMf	0.12	0.06	0.10

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-22.30	-52.30	-15.20	-22.30	-52.40	-15.10	-22.30	-52.40	-14.90
Landmark 2	Lmef	21.70	-50.50	-14.60	21.80	-50.40	-14.80	21.60	-50.50	-14.60
Landmark 3	RMf	-40.50	-19.90	-56.00	-40.40	-20.20	-55.80	-40.50	-20.10	-56.00
Landmark 4	LMf	37.30	-21.40	-55.60	37.30	-21.30	-55.70	37.10	-21.30	-55.50

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-44.00	-1.90	-0.40	44.04
RMf to LMf	-77.70	1.27	-0.33	77.71
RMf to Rmef	-18.17	32.30	-40.87	55.17
LMf to Lmef	15.53	29.13	-40.93	52.59
RMf to Lmef	-62.17	30.40	-41.27	80.57
LMf to Rmef	59.53	31.03	-40.53	78.42

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	1.30
RMf to LMf	1.92
RMf to Rmef	2.33
LMf to Lmef	1.11
RMf to Lmef	3.03
LMf to Rmef	1.61

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-16.80	29.90	-40.10	52.77	-16.50	30.20	-40.20	52.92	-16.80	30.40	-39.80	52.82
RMef-LMef	B	-42.70	-2.50	-1.40	42.80	-42.80	-2.10	-1.20	42.87	-42.50	-2.10	-1.30	42.57
LMf-Lmef	C	16.30	28.60	-40.10	51.88	16.30	28.30	-39.50	51.25	16.60	28.50	-39.30	51.31
RMf-LMf	D	-75.80	-1.20	-1.40	75.82	-75.60	-0.20	-1.90	75.62	-75.90	-0.20	-1.80	75.92
RMf-Lmef	E	-59.50	27.40	-41.50	77.55	-59.30	28.10	-41.40	77.59	-59.30	28.30	-41.10	77.50
LMf-Rmef	F	59.00	31.10	-38.70	77.11	59.10	30.40	-38.30	76.71	59.10	30.60	-38.00	76.64

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.89	108.02	1.88	107.73	1.89	108.19
b	BCF	1.90	108.69	1.90	108.84	1.90	109.09
c	CDE	1.26	72.03	1.27	72.54	1.26	72.14
d	ADF	1.24	71.13	1.24	70.77	1.23	70.47
Sum			**359.87**		**359.90**		**359.88**

T1 Average Angles	
Angles	Degrees
a	107.98
b	108.87
c	72.24
d	70.79
Sum	**359.88**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-18.20	32.40	-40.80	55.19	-18.10	32.20	-40.70	54.96	-18.20	32.30	-41.10	55.35
RMef-LMef	B	-44.00	-1.80	-0.60	44.04	-44.10	-2.00	-0.30	44.15	-43.90	-1.90	-0.30	43.94
LMf-Lmef	C	15.60	29.10	-41.00	52.64	15.50	29.10	-40.90	52.53	15.50	29.20	-40.90	52.59
RMf-LMf	D	-77.80	1.50	-0.40	77.82	-77.70	1.10	-0.10	77.71	-77.60	1.20	-0.50	77.61
RMf-Lmef	E	-62.20	30.60	-41.40	80.74	-62.20	30.20	-41.00	80.39	-62.10	30.40	-41.40	80.59
LMf-Rmef	F	59.60	30.90	-40.40	78.35	59.60	31.10	-40.60	78.53	59.40	31.10	-40.60	78.38

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.89	108.39		1.88	107.91		1.88	107.96
b	BCF	1.88	107.94		1.89	108.33		1.89	108.25
c	CDE	1.29	73.64		1.28	73.37		1.29	73.67
d	ADF	1.22	69.83		1.23	70.21		1.22	69.97
Sum			359.81			359.82			359.85

T2 Average Angles		
Angles		Degrees
a		108.09
b		108.17
c		73.56
d		70.00
Sum		359.83

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.10
b	-0.70
c	1.33
d	-0.79

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-21.43	-48.67	-0.73
Landmark 2	Lmef	20.47	-46.67	1.97
Landmark 3	RMf	-41.67	-23.30	-46.83
Landmark 4	LMf	43.37	-17.83	-45.63

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.15	0.06
Landmark 2	Lmef	0.06	0.06	0.06
Landmark 3	RMf	0.06	0.10	0.23
Landmark 4	LMf	0.06	0.15	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-21.40	-48.50	-0.70	-21.40	-48.70	-0.70	-21.50	-48.80	-0.80
Landmark 2	Lmef	20.50	-46.70	1.90	20.40	-46.60	2.00	20.50	-46.70	2.00
Landmark 3	RMf	-41.70	-23.20	-47.10	-41.70	-23.40	-46.70	-41.60	-23.30	-46.70
Landmark 4	LMf	43.40	-17.80	-45.60	43.30	-17.70	-45.80	43.40	-18.00	-45.50

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.90	-2.00	-2.70	42.03
RMf to LMf	-85.03	-5.47	-1.20	85.22
RMf to Rmef	-20.23	25.37	-46.10	56.37
LMf to Lmef	22.90	28.83	-47.60	60.18
RMf to Lmef	-62.13	23.37	-48.80	82.39
LMf to Rmef	64.80	30.83	-44.90	84.65

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-22.70	-53.13	2.47
Landmark 2	Lmef	19.53	-52.47	4.73
Landmark 3	RMf	-42.33	-26.23	-43.50
Landmark 4	LMf	42.93	-23.57	-42.80

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.10	0.15	0.06
Landmark 2	Lmef	0.06	0.06	0.06
Landmark 3	RMf	0.12	0.06	0.10
Landmark 4	LMf	0.15	0.21	0.20

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-22.80	-53.00	2.50	-22.70	-53.10	2.50	-22.60	-53.30	2.40
Landmark 2	Lmef	19.60	-52.50	4.70	19.50	-52.40	4.80	19.50	-52.50	4.70
Landmark 3	RMf	-42.20	-26.20	-43.50	-42.40	-26.20	-43.40	-42.40	-26.30	-43.60
Landmark 4	LMf	42.80	-23.40	-43.00	42.90	-23.80	-42.60	43.10	-23.50	-42.80

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-42.23	-0.67	-2.27	42.30
RMf to LMf	-85.27	-2.67	-0.70	85.31
RMf to Rmef	-19.63	26.90	-45.97	56.76
LMf to Lmef	23.40	28.90	-47.53	60.35
RMf to Lmef	-61.87	26.23	-48.23	82.72
LMf to Rmef	65.63	29.57	-45.27	85.04

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.26
RMf to LMf	0.09
RMf to Rmef	0.39
LMf to Lmef	0.17
RMf to Lmef	0.33
LMf to Rmef	0.38

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-20.30	25.30	-46.40	56.61	-20.30	25.30	-46.00	56.29	-20.10	25.50	-45.90	56.22
RMef-LMef	B	-41.90	-1.80	-2.60	42.02	-41.80	-2.10	-2.70	41.94	-42.00	-2.10	-2.80	42.15
LMf-Lmef	C	22.90	28.90	-47.50	60.13	22.90	28.90	-47.80	60.37	22.90	28.70	-47.50	60.04
RMf-LMf	D	-85.10	-5.40	-1.50	85.28	-85.00	-5.70	-0.90	85.20	-85.00	-5.30	-1.20	85.17
RMf-Lmef	E	-62.20	23.50	-49.00	82.60	-62.10	23.20	-48.70	82.26	-62.10	23.40	-48.70	82.31
LMf-Rmef	F	64.80	30.70	-44.90	84.60	64.70	31.00	-45.10	84.74	64.90	30.80	-44.70	84.61

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.97	112.90	1.97	112.93	1.97	112.82
b	BCF	1.93	110.58	1.93	110.55	1.93	110.57
c	CDE	1.16	66.64	1.16	66.29	1.16	66.47
d	ADF	1.22	69.88	1.23	70.22	1.22	70.12
Sum			**360.00**		**359.99**		**359.98**

T1 Average Angles	
Angles	Degrees
a	112.88
b	110.57
c	66.46
d	70.08
Sum	**359.99**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-19.40	26.80	-46.00	56.66	-19.70	26.90	-45.90	56.73	-19.80	27.00	-46.00	56.89
RMef-LMef	B	-42.40	-0.50	-2.20	42.46	-42.20	-0.70	-2.30	42.27	-42.10	-0.80	-2.30	42.17
LMf-Lmef	C	23.20	29.10	-47.70	60.50	23.40	28.60	-47.40	60.10	23.60	29.00	-47.50	60.45
RMf-LMf	D	-85.00	-2.80	-0.50	85.05	-85.30	-2.40	-0.80	85.34	-85.50	-2.80	-0.80	85.55
RMf-Lmef	E	-61.80	26.30	-48.20	82.67	-61.90	26.20	-48.20	82.71	-61.90	26.20	-48.30	82.77
LMf-Rmef	F	65.60	29.60	-45.50	85.15	65.60	29.30	-45.10	84.83	65.70	29.80	-45.20	85.13

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.96	112.23		1.96	112.51		1.96	112.49
b	BCF	1.93	110.35		1.93	110.71		1.93	110.85
c	CDE	1.17	66.77		1.16	66.72		1.16	66.51
d	ADF	1.23	70.65		1.22	70.04		1.22	70.13
Sum			360.00			359.99			359.99

T2 Average Angles		
Angles		Degrees
a		112.41
b		110.64
c		66.67
d		70.27
Sum		359.99

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	-0.47
b	0.07
c	0.20
d	0.20

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T1 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-11.17	-52.60	-21.60
Landmark 2	Lmef	30.67	-49.13	-22.70
Landmark 3	RMf	-36.40	-11.50	-57.27
Landmark 4	LMf	44.33	-5.60	-57.17

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.12	0.17	0.10
Landmark 2	Lmef	0.15	0.06	0.00
Landmark 3	RMf	0.10	0.10	0.06
Landmark 4	LMf	0.15	0.10	0.15

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-11.30	-52.40	-21.50	-11.10	-52.70	-21.70	-11.10	-52.70	-21.60
Landmark 2	Lmef	30.50	-49.10	-22.70	30.80	-49.20	-22.70	30.70	-49.10	-22.70
Landmark 3	RMf	-36.40	-11.50	-57.30	-36.30	-11.60	-57.20	-36.50	-11.40	-57.30
Landmark 4	LMf	44.20	-5.60	-57.20	44.30	-5.70	-57.30	44.50	-5.50	-57.00

T1 Distances

	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.83	-3.47	1.10	41.99
RMf to LMf	-80.73	-5.90	-0.10	80.95
RMf to Rmef	-25.23	41.10	-35.67	59.98
LMf to Lmef	13.67	43.53	-34.47	57.18
RMf to Lmef	-67.07	37.63	-34.57	84.32
LMf to Rmef	55.50	47.00	-35.57	80.96

T2 Coordinates

Averages		X	Y	Z
Landmark 1	Rmef	-6.47	-54.33	-17.67
Landmark 2	Lmef	35.30	-48.47	-18.43
Landmark 3	RMf	-35.43	-13.60	-56.47
Landmark 4	LMf	47.73	-3.93	-55.57

Standard Deviation		X	Y	Z
Landmark 1	Rmef	0.06	0.06	0.06
Landmark 2	Lmef	0.10	0.12	0.06
Landmark 3	RMf	0.12	0.00	0.15
Landmark 4	LMf	0.25	0.25	0.06

		Data Set 1			Data Set 2			Data Set 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Landmark 1	Rmef	-6.50	-54.30	-17.70	-6.40	-54.40	-17.70	-6.50	-54.30	-17.60
Landmark 2	Lmef	35.30	-48.60	-18.40	35.20	-48.40	-18.50	35.40	-48.40	-18.40
Landmark 3	RMf	-35.50	-13.60	-56.60	-35.50	-13.60	-56.50	-35.30	-13.60	-56.30
Landmark 4	LMf	47.70	-3.70	-55.50	48.00	-4.20	-55.60	47.50	-3.90	-55.60

T2 Distances

(mm)	x2-x1	y2-y1	z2-z1	Distance
Rmef to Lmef	-41.77	-5.87	0.77	42.18
RMf to LMf	-83.17	-9.67	-0.90	83.73
RMf to Rmef	-28.97	40.73	-38.80	63.27
LMf to Lmef	12.43	44.53	-37.13	59.30
RMf to Lmef	-70.73	34.87	-38.03	87.55
LMf to Rmef	54.20	50.40	-37.90	83.15

Distance Difference (Growth)

	Distance T2-T1 (mm)
Rmef to Lmef	0.19
RMf to LMf	2.78
RMf to Rmef	3.29
LMf to Lmef	2.12
RMf to Lmef	3.24
LMf to Rmef	2.19

T1 Angles

T1		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-25.10	40.90	-35.80	59.87	-25.20	41.10	-35.50	59.87	-25.40	41.30	-35.70	60.21
RMef-LMef	B	-41.80	-3.30	1.20	41.95	-41.90	-3.50	1.00	42.06	-41.80	-3.60	1.10	41.97
LMf-Lmef	C	13.70	43.50	-34.50	57.19	13.50	43.50	-34.60	57.20	13.80	43.60	-34.30	57.17
RMf-LMf	D	-80.60	-5.90	-0.10	80.82	-80.60	-5.90	0.10	80.82	-81.00	-5.90	-0.30	81.22
RMf-Lmef	E	-66.90	37.60	-34.60	84.18	-67.10	37.60	-34.50	84.30	-67.20	37.70	-34.60	84.46
LMf-Rmef	F	55.50	46.80	-35.70	80.90	55.40	47.00	-35.60	80.90	55.60	47.20	-35.40	81.07

T1	Data Set 1			Data Set 2		Data Set 3	
Angles	Tri	Radians	Degrees	Radians	Degrees	Radians	Degrees
a	ABE	1.93	110.30	1.93	110.37	1.92	110.23
b	BCF	1.89	108.41	1.89	108.23	1.90	108.76
c	CDE	1.27	72.92	1.27	73.04	1.27	72.91
d	ADF	1.19	68.35	1.19	68.35	1.19	68.09
Sum		**359.98**			**359.99**		**359.99**

T1 Average Angles	
Angles	Degrees
a	110.30
b	108.47
c	72.96
d	68.26
Sum	**359.98**

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2 Angles

T2		Data Set 1				Data Set 2				Data Set 3			
Points	Sides	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance	x2-x1	y2-y1	z2-z1	Distance
RMf-RMef	A	-29.00	40.70	-38.90	63.33	-29.10	40.80	-38.80	63.38	-28.80	40.70	-38.70	63.12
RMef-LMef	B	-41.80	-5.70	0.70	42.19	-41.60	-6.00	0.80	42.04	-41.90	-5.90	0.80	42.32
LMf-Lmef	C	12.40	44.90	-37.10	59.55	12.80	44.20	-37.10	59.11	12.10	44.50	-37.20	59.25
RMf-LMf	D	-83.20	-9.90	-1.10	83.79	-83.50	-9.40	-0.90	84.03	-82.80	-9.70	-0.70	83.37
RMf-Lmef	E	-70.80	35.00	-38.20	87.73	-70.70	34.80	-38.00	87.48	-70.70	34.80	-37.90	87.44
LMf-Rmef	F	54.20	50.60	-37.80	83.23	54.40	50.20	-37.90	83.16	54.00	50.40	-38.00	83.07

T2	Data Set 1				Data Set 2			Data Set 3	
Angles	Tri	Radians	Degrees		Radians	Degrees		Radians	Degrees
a	ABE	1.94	110.89		1.93	110.54		1.93	110.50
b	BCF	1.89	108.57		1.91	109.45		1.90	108.59
c	CDE	1.28	73.28		1.27	73.02		1.28	73.44
d	ADF	1.17	67.24		1.17	67.00		1.18	67.46
Sum			359.99			360.00			360.00

T2 Average Angles		
Angles		Degrees
a		110.65
b		108.87
c		73.25
d		67.23
Sum		360.00

a	cos^-1((A^2+B^2-E^2)/2AB)
b	cos^-1((B^2+C^2-F^2)/2BC)
c	cos^-1((C^2+D^2-E^2)/2CD)
d	cos^-1((A^2+D^2-F^2)/2AD)

T2-T1 Average Angle Change

T2 -T1 Average Angle Change	
Angles	Difference (degrees)
a	0.35
b	0.40
c	0.29
d	-1.03