

Applications

- traditional and novel measures of acetabular orientation based on 3D imaging
- Diagnostic aid integrated into radiological software to assist in surgical planning
- Patient-specific implant design & surgical plans
- Research tool
- Develop a database containing “normal” anthropometric data for implant design

Advantages

- Highly accurate and consistent measures
- Algorithm can be incorporated into existing radiological software
- Automated point selection for AR determination saves time, reduces human error

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Market Need

Pelvic abnormalities can be detrimental to the biomechanics of the hip and often lead to health consequences like osteoarthritis and subluxation. Current methods of determining acetabular orientation are dependent on 2D radiographs despite the complex three-dimensional characteristics of abnormalities. A better method to determine acetabular orientation would elucidate abnormalities at the hip joint and allow for improved surgical planning and implant design.

Technology Summary

VCU researchers have developed the Acetabulator, a highly accurate algorithm to determine acetabular orientation via the identification of common bony landmarks on the pelvis. Unlike many current methods that gather measurements based on 2D radiographs, this new algorithm allows a user to assess both traditional and novel measures of orientation from 3D imaging data. Accepted pelvic measurements are performed using a coordinate system based on the anterior pelvic plane (APP). Point selection along the acetabular rim (AR) and subsequent determination of acetabular orientation is automated, thus saving the user's time and reducing the sources of human error. Furthermore, novel measurements can be made based on the hemipelvis alone, thereby eliminating the assumption of bilateral symmetry.

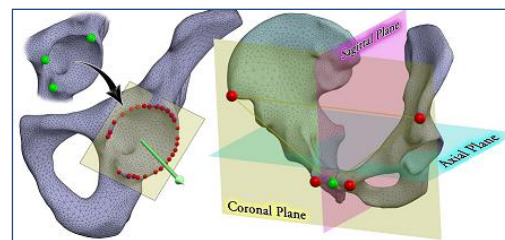
The Acetabulator can be incorporated into existing radiological software allowing a clinician to easily assess acetabular orientation for the purpose of surgical planning. Additionally, the Acetabulator may be used to determine patient-specific implant design. Its use in developing a database of “normals” for a specific patient population or for the general population would also lend itself to implant design or for use as a research tool.

Technology Status

Patent Pending: US and foreign rights available.

Measurements collected for over 400 acetabulums were found to be similar to other researchers' findings; however the accuracy and database size permitted previously unknown differences to come to light.

This technology is available for licensing to industry for further development and commercialization.



Plane fit to AR with vector normal indicating acetabular orientation (left) and APP-based coordinate system (right).