Hip surveillance at your fingertips!
**HipScreen: An App for Community-Based Hip Surveillance**

Hip Surveillance for children with cerebral palsy can lead to early detection and treatment of hip dysplasia, improving function and reducing the risk of hip pain. The free HipScreen app contains several features to help promote implementation of a hip surveillance program for children with cerebral palsy.

HipScreen contains educational material based on peer-reviewed publications on hip surveillance, all formatted as PDFs to allow for easy sharing and printing. HipScreen includes information on:

- Assessing a child with cerebral palsy with a focused hip exam
- Obtaining a properly positioned x-ray with a standardized written protocol
- Interpreting a hip surveillance x-ray
The 2014 Australian Hip Surveillance Guidelines for Children with Cerebral Palsy have been clarified and formatted for easy access to a child’s recommended schedule of x-rays and physical exams based on their Gross Motor Function Classification System Level (GMFCS) and hemiplegic gait type.

Just touch the patient’s GMFCS level, and HipScreen shows you the appropriate schedule of hip surveillance.
A pelvic x-ray is the cornerstone of early identification of hip displacement in children with cerebral palsy. The most important measurement is the “Migration Percentage,” of the percent of the femoral head that is outside the bony acetabulum.

HipScreen’s Migration Percentage Ruler allows a user to take a photograph of an x-ray with the device’s embedded camera, and then directly measure the Migration Percentage of the hip from the screen. This measurement technique uses the advantage of the device’s touchscreen, allowing for determination of the Migration Percentage without any calculation.
Using the *Migration Percentage Ruler*

Hip Surveillance is a schedule of regular clinical and x-ray examinations. The most important measurement on an x-ray is each hip’s *migration percentage*, or the percentage of the femoral head that is outside of the margin of the acetabulum (green line).

There is an increased risk of progressive hip displacement if the *migration percentage* is equal or greater than **30%**. The standard technique to measure Migration Percentage requires measurement of distances, as shown below:

\[
\text{Migration Percentage} = \frac{\text{Distance } A}{\text{Distance } B} \times 100\%
\]
The Migration Percentage Ruler tool of HipScreen works in a fundamentally different manner than the normal calculation of Migration Percentage on an x-ray monitor.

Using the touchscreen feature of the iPhone, the Migration Percentage Ruler allows you to fit the femoral head ossific nucleus to the ruler – allowing for quick calculation of the Migration Percentage without measurement of distance.
Let’s first explore the buttons ...

- Take Picture of an X-Ray
- Load an X-Ray already on your device
- Rotate the X-Ray
- Apply the Ruler Overlay
- Back to Main Menu
Step 1:
Load the X-Ray image into HipScreen

Take a picture of an x-ray, or load an x-ray already stored in your “Photos” into HipScreen.

*Pictures taken within the HipScreen App are not stored on your phone.*
Step 2:
Rotate image to level the pelvis.

Opens up the Rotate Tool.
“CW” rotates clockwise.
“CCW” rotates counter clockwise.
Press “Done” when finished rotating.
Use the CW and CCW buttons to level the pelvis using any of the common landmarks marked by the arrows below.

- Tri-radiate cartilage
- Ischial Tuberosity
- Acetabular Teardrop
- Iliac Crest

Remember, you can Pinch-Zoom and Pan to place the lines over the landmarks.
Step 3:
Use the Ruler to determine Migration Percentage.

Press “Ruler” to toggle this feature on and off.

The right half of the ruler is used for the hip on the right side of the screen. The left half of the ruler is used for the hip on the left side of the screen.
Use the familiar touchscreen iPhone features to pinch-zoom and pan the image so that:

- **White** line touches the lateral border of the femoral head ossific nucleus
- **Black** line touches the medial border of the femoral head ossific nucleus

[Image of mobile phone with pinch-zoom gesture]
Remember, you can toggle the ruler on and off.

You can also Pinch-Zoom and Pan with or without the ruler.
When the femoral head ossific nucleus is appropriately positioned between the white and black lines, the femoral head is divided into 10% increments by the vertical lines.

The Migration Percentage can be calculated by finding the vertical line that touches the lateral edge of the acetabulum. Each line is 10% of the femoral head, so in this example, the Migration Percentage is 10%.

If the lateral edge of the acetabulum is within the red box, then the migration percentage is above 30%.
If the migration percentage is **below** 30%, the lateral edge of the acetabulum will be **outside** the red box.

If the migration percentage is **above** 30%, the lateral edge of the acetabulum will be **inside** the red box.
There is an increased risk of progressive hip displacement if the Migration Percentage is equal or greater than 30%.

If the migration percentage is above 30%, the lateral edge of the acetabulum will be inside the red box.
Learn more at www.hipscreen.org!