HOME-BASED VIDEO APPLICATION TO QUANTIFY INFANT POSTURAL CONTROL AND MOVEMENT: Angles-Video Goniometer©

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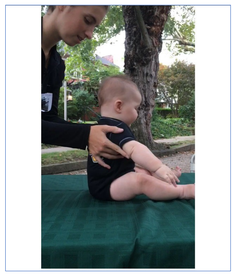
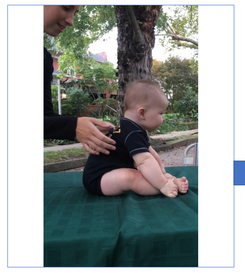
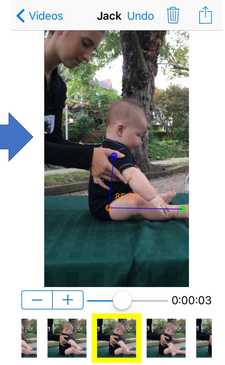
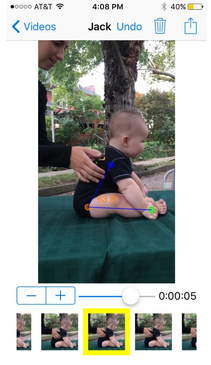
Background

- Early intervention takes places primarily outside of clinics in the natural setting of the home
- Infant posture and movement is difficult to document
- Both visual and goniometric methods of measurement in infants have low reliability[1]
- Purpose: Create a method to capture natural, functional movement in a quantitative way in infants
- Provide the method as an inexpensive, user-friendly application on phone or iPad



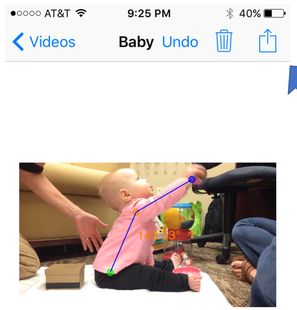






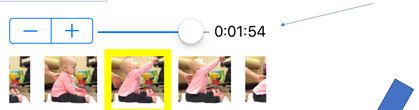
Reliability & Validity

- Within 1° of goniometer in pilot testing
- Intraclass correlation coefficient=0.91 between 3 raters for infant sitting videos in START-Play study
- ICC agreement higher than manual goniometry[1]
- ICC between 3 coders for infant angles greater than photo method[2]



Step forward or backward frame-by-frame to get exact time of behavior

Slide button to behavior or time of interest



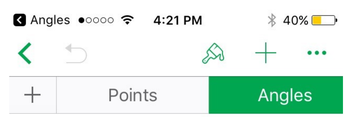
After marking angles:

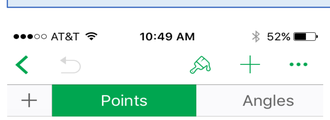
- Drag marked dots to adjust or undo mark and correct
- Select any unwanted frames and trash them
- Press the export button to get spreadsheet of values for quantification of movement or further analysis

Export will provide:

- Times of each selected frame
- X-Y coordinates of points selected
- Angles created for intersecting lines

- Select points (x-y coordinates)) if desired for further analysis; points represent pixels of screen
- Select angles for goniometric measures





Time (seconds)	Angle 1 (degrees)
3.235	85.16460060406
3.301666666666667	85.57469120646
4.636666666666667	63.36219185000
4.936666666666667	56.91269732604
5.17	53.32675866107
5.771666666666667	57.89959134647

Time (seconds)	Point 1	Point 2	Point 3
3.235	328.740360, 635.064267)	312.287918, 911.465296)	341.336761, 903.239075)
3.301666666666667	346.838046, 626.838046)	322.159383, 885.141388)	87.403599, 891.722365)
4.636666666666667	337.326478, 654.807198)	297.480720, 904.884319)	26.529563, 919.691517)
4.936666666666667	371.876407, 636.709512)	62.930591, 916.755784)	55.784062, 934.498715)
5.17	347.197943, 636.709512)	56.349614, 886.786632)	34.395887, 890.077121)
5.771666666666667	302.776350, 656.452442)	57.994859, 870.334190)	88.688946, 881.850900)

Description

- The Angles Video Goniometer application for iPhone and iPad was developed as a simple and intuitive tool for measurement of infant movement.
- The app either takes or imports videos from iPhone or iPad, and allows the user to drag the video to select specific frames for goniometric measurement of angles
- Use mirrors that of a real goniometer, but allows measurement to be taken during a functional, goal-directed movement

Use

- Move video to desired movement with slider
- Use + or – buttons to find the exact frame
- Touch angle points on screen just as you would line up a goniometer – must be a sagittal view
- Drag points to get exact position of angle
- Take multiple frames if you want to calculate velocity

References

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2. Rahlin, M., & Sarmiento, B. (2010). Reliability of still photography measuring habitual head deviation from midline in infants with congenital muscular torticollis. *Pediatric Physical Therapy*, *22*(4), 399-406.
3. ©Nathanial Joseph Cochran 2017; nathancochran.info

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