

Appendix C: Assessment of Sentinel Facial Features

1. Measuring Palpebral Fissure Length

Follow these steps to accurately measure PFL manually:

- Use a small transparent ruler
- Align yourself directly in front of the patient's eye
- Remove glasses, if the patient wears them
- Place the ruler as close to the eye without touching the lashes
- Get the patient to open their eyes wide by looking up at the ceiling without tilting their head upwards
- Repeat this for the other eye

Using the PFL Z-score calculator

The mean PFL measurement (average of the left and right PFL) is typed into the PFL calculator (on the right of the screen). The patient's birth date and the date of measurement is also entered in order to calculate the patient's current age.

The PFL Z scores are then automatically calculated (right column).

To download the PFL Z-score calculator follow this link:

<https://depts.washington.edu/fasdnp/htmls/diagnostic-tools.htm#pfl>

Palpebral Fissure Length (PFL) Z-score Calculator

Instructions: Enter data in yellow cells. All remaining cells will automatically compute.

Patient birth date (mm/dd/yyyy)	Date PFL Measured (mm/dd/yyyy)	Patient's age (years)	Patient's PFL (mm)
July 9, 2012	August 25, 2015	3.13	21.00

PFL Normal Growth Chart	Applicable Age Range	Mean PFL for Normal Population (mm)	Patient's PFL Z-score*
Caucasian Male or Female (Hall, 1989)	0-16 yrs	24.97	-3.01
Canadian Female (Clarren et al., 2010)	6-16 yrs	Too Young	Too Young
Canadian Male (Clarren et al., 2010)	6-16 yrs	Too Young	Too Young
Scandinavian Female (Stromland et al., 1999)	0-18 yrs	23.35	-2.07
Scandinavian Male (Stromland et al., 1999)	0-18 yrs	23.80	-2.41

Using software to assess PFL

PFL can be measured on *digital facial photographs using software developed by the University of Washington*. <https://depts.washington.edu/fasdnp/htmls/face-software.htm>

Considerations

- Manual measurement of palpebral fissure length is prone to error and variation between examiners.
- Measurement by photographic facial analysis is more accurate
- If clinicians may not have access to the software then direct manual measurement should be used.
- When software is available, using both manual and photographic facial analysis is recommended. If there is significant discrepancy between measurements, clinical judgement is required regarding which is more accurate.
 - For example, manual measurements may have been inaccurate due to a child moving or not opening their eyes properly.
 - Photographs might be affected by similar issues leading to poor quality photos for analysis.

2. Measuring the Philtrum and Lip

The lip and philtrum can be assessed clinically by direct examination using Lip-Philtrum guides developed by the University of Washington.

To obtain Lip and Philtrum Guides

- Digital version for smart phones or tablets can be downloaded
- Hard copies can be ordered.
- Following this link: <https://depts.washington.edu/fasdprn/htmls/lip-philtrum-guides.htm>

Using the Lip-Philtrum Guides during assessment

To use the guide properly, the clinician should:

- Be just below eye level in front of the patient, at the so-called frankfort level.
 - The *frankfort horizontal plane* is a line (green line) that passes through the patient's external auditory canal and the lowest border of the bony orbital rim (eye socket).
 - The physician's eyes (or camera lens) should be directly in line with this plane (see photo on page 77).
 - This is important, e.g. if the physician stands above the plane looking down on the patient, the patient's upper lip could appear thinner than it truly is.
- Hold the guide next to their face (see photo on page 77).
- The patient must have a relaxed facial expression, because a smile can alter lip thinness and philtrum smoothness.
- A short video tutorial on assessing the lip and philtrum using the guides is available at: <https://depts.washington.edu/fasdprn/htmls/lip-philtrum-guides.htm>.

Using software to assess the lip and philtrum

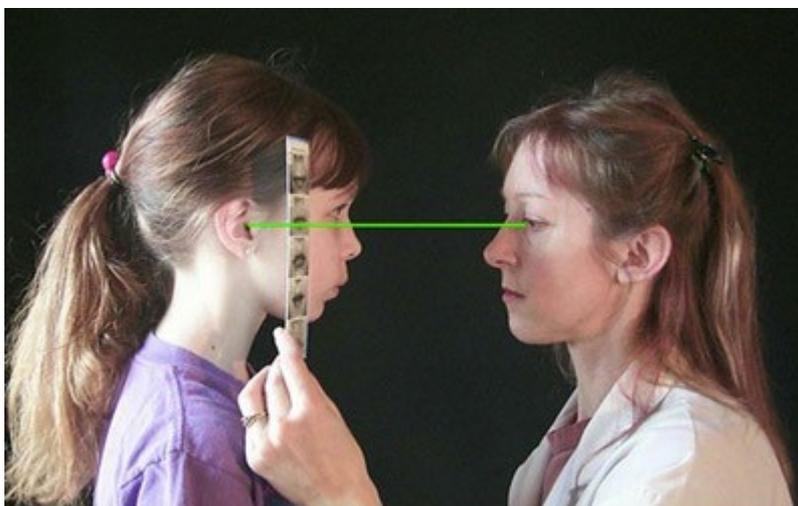
The lip and philtrum can be assessed by *analysis of digital facial photographs using software* developed by the University of Washington.

The software allows the clinician to visually re-assess the patient using the digital photographs, and to calculate lip thickness (lip circularity).

<https://depts.washington.edu/fasdprn/htmls/face-software.htm>

Lip Philtrum Guides

Caucasian		African American		
FASD 4-Digit Diagnostic Code © 2014 Susan Astley, University of Washington fasdpu.org		FASD 4-Digit Diagnostic Code © 2014 Susan Astley, University of Washington fasdpu.org		
5	5	5	5	Sentinel Facial Features
4	4	4	4	
3	3	3	3	Not associated with prenatal alcohol exposure, below diagnostic threshold for FASD
2	2	2	2	
1	1	1	1	
Lip-Philtrum Guide 1	Philtrum Guide	Lip-Philtrum Guide 2	Philtrum Guide	
For use as a digital image on a smartphone or tablet. Printing invalidates Guide. Square ensures length by width ratio of image is correct.		For use as a digital image on a smartphone or tablet. Printing invalidates Guide. Square ensures length by width ratio of image is correct.		
□		□		
Frontal view and ¾ view		Frontal view and ¾ view		



Images: Courtesy of Professor Susan Astley

Photo demonstrating how to use lip-philtrum guides including positioning at the *Frankfort* level (green line).