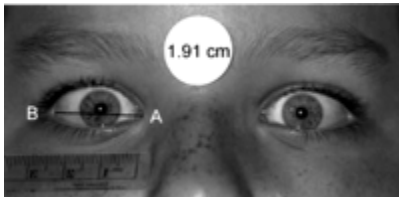


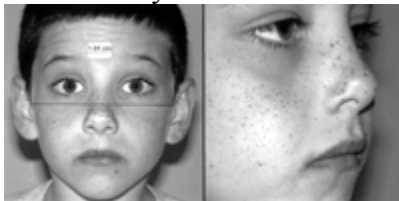
### ***Photographic measurement of facial features***

An internal measure of scale is placed on the patient's forehead between the eyebrows (Figs 1 and 6\*\*). A small, adhesive paper sticker 1/2in. to 3/4in. in size serves well and can be purchased from an office supply store. A frontal and 3/4 view photograph of the patient's face is obtained using a digital or 35-mm camera. Polaroid cameras do not provide sufficient image resolution. A close-up photograph is taken, such that the patient's head fills the entire frame (Fig. 6\*). When using a digital camera, a minimum of 3 megapixel resolution is recommended. The lens of the camera is placed in line with the patient's Frankfort horizontal plane, as described above and illustrated in Fig. 4\*. To judge the Frankfort horizontal plane when viewing the face through the camera, an imaginary line drawn between the upper border of the left and right tragus should fall across the left and right lower bony orbital rim (Fig. 6\*). There should also be no left-to-right rotation of the image; both ears should be equally visible in the frontal photograph. The facial expression should be relaxed with no smile, lips gently closed, eyes wide open, and no eyeglasses. The 3/4 view is taken to facilitate ranking philtrum smoothness by purposely driving a flash of light across the philtrum to see if a shadow is cast. The 3/4 view is particularly important to obtain if the camera has a centrally mounted flash that can diminish the appearance of a grooved philtrum in a frontal photograph. Properly aligned facial photographs are obtained in the FAS DPN clinics with a hand-held camera and freestanding patient. Stereotaxic equipment and tripods are not necessary.



**View larger version (81K):**

Fig. 1. Palpebral fissure length. Palpebral fissure length (PFL) is measured from the endocanthion (A) to the exocanthion (B). It can be measured directly using a clear plastic centimetre ruler, or it can be measured from a photograph with an internal measure of scale (adhesive paper sticker) placed between the eyebrows or a centimetre ruler placed below the eye.



**View larger version (100K):**

Fig. 6. Standardized facial photographs. Two standardized facial photographs are obtained (frontal, 3/4 view) to measure the facial phenotype of FAS. Eyes should be fully open, no eyeglasses, no smile, lips gently closed, and an internal measure of scale placed

between the eyebrows. The right and left ears should be equally visible to ensure accurate measurement of the palpebral fissure lengths and inner canthal distance. An imaginary line drawn from the top of the left and right tragus should fall along the patient's lower bony orbital rims, confirming that the camera is aligned in the patient's Frankfort horizontal plane (see Fig. 4\*). The 3/4 view is obtained to facilitate ranking the philtrum. It is particularly important if the camera has a centrally mounted flash that can diminish the appearance of the philtrum depth in a frontal photograph.



**View larger version** (133K):

Fig. 5. Impact of a smile on lip and philtrum measures. This is the same individual with (upper photograph) and without (lower photograph) a smile demonstrating how a smile can erroneously transform a deeply grooved philtrum (Likert rank = 2) and full upper lip (Likert rank = 1, lip circularity = 41) into a smooth philtrum (Likert rank = 4) and thin upper lip (Likert rank 5, lip circularity = 191) (Astley and Clarren, 1996\*). Circularity (perimeter<sup>2</sup>/area) is a continuous measure of upper lip thinness that can be used to facilitate the ranking of upper lip thinness (Figs 2 and 3\*\*).