

## 1 ☐ Calculating the Actual Deficiency

Will my patient need a heel lift?

## 2 ☐ Gonstead noticed something

- He saw patients leg lengths change after adjustments
- He wondered if it were consistent from patient to patient

## 3 ☐ It was consistent

- There is a 5 to 2 relationship
- For every 5 millimeters of Ilium shift,
- There was 2 millimeters of femur shift

## 4 ☐ The 2:5 ratio

- Mathematically, that turns out to say that the femur will shift a total of 40% of the distance the pelvis did.

## 5 ☐ That's a bit cumberson

- so instead of saying 2:5, we'll just say 40% or .4 is the constant.

## 6 ☐ Two ways of looking at calculation of Femur head heights

## 7 ☐ If you are not so math minded, try following this way:

### 8 ☐ 1. Go to the short leg side

(this is merely for simplicity's sake).

### 9 ☐ 2. Sorting out the movements

For whatever the listing would be on that side, you will need to combine the two numbers either by adding or subtracting them.

If the listing is **Plex** or **ASin**, add the two numbers.

If the listing is **Plin** or **ASex**, subtract the smaller subscript from the larger subscript.

## 10 ☐ Let's simplify that:

On the X-ray:

PI or Ex → Femur head UP after adjustment

AS or In → Femur head DOWN after adjustment

If both halves of your listing are above or below the line,

ADD,

if not

SUBTRACT

- 11 ☐ **3. Use your constant**  
Multiply the answer by .4.  
This is the amount of **femur correction**.  
It is the amount the femur will shift as a result of your adjustment
- 12 ☐ **Which way did they go, George?**  
If your listing was ASin or your larger subscript was AS or in  
then the femur head on the short leg side will be going in an inferiorward direction when you correct the pelvis.  
If your listing was Plex or the larger subscript was PI or ex,  
then the correction will bring the femur head up.
- 13 ☐ **Add or Subtract**  
If your direction of correction raises the short femur head,  
then subtract the **femur correction** amount from the **measured difference**.  
If the correction lowers the short femur head  
then add the two numbers.
- 14 ☐ **Whoah!... I just got something weird**  
If you subtract and get a negative number,  
that means that the heads have "crossed over" and now the opposite side is short  
by the absolute value of the answer  
(i.e. the number without the sign).
- 15 ☐ **This answer is your A.D.**  
"Anatomical Difference" or "Actual Difference"  
It is the deficiency that will remain following your adjustment
- 16 ☐ **Mathematical:**  
If you are math-minded, you might prefer to look at it this way:
- 17 ☐ **1. Begin on the short leg side**  
(for simplicity's sake).
- 18 ☐ **Plusses and Minuses**  
Using the listing for the short leg side, regardless of whether it is your actual listing  
or not,
- 19 ☐ **you will assign the subscripts the following:**  
AS and in subscripts are given a negative value  
PI and ex subscripts are given a positive value
- 20 ☐ **A little math**  
Add the subscripts for your listing (Keeping the signs in mind from before)  
i.e.  $PI_8in_6$  would look like this:  $8-6= 2$   
 $AS_8ex_6$  would look like this:  $-8+6= -2$

Pl<sub>8</sub>ex<sub>6</sub> would look like this:  $8+6= 14$

AS<sub>8</sub>in<sub>6</sub> would look like this:  $-8-6= -14$

- 21 ☐ You really don't have to think about this right now but...  
a **negative** answer would indicate that the femur head on the short side will be going **down after correction**... a **positive** answer would indicate that the femur head on that side will be going **up after correction**
- 22 ☐ Apply the constant  
Multiply the answer by .4.  
This is the amount of **femur correction** (retain the sign).
- 23 ☐ Apply the shift  
Subtract the femur correction amount from the measured difference  
(keep your signs in mind - subtracting a negative is the same as adding).
- 24 ☐ That weird answer again  
If you subtract and get a negative number, that means that the heads have "crossed over"  
and now the opposite side is short by the absolute value of the answer.
- 25 ☐ And just what does that mean to me?  
This answer is your A.D. ("Anatomical Difference" or "Actual Difference").  
It is the deficiency that will remain following your adjustment.
- 26 ☐ **NOTE:**  
Should you have chosen the long leg side to do your calculations, don't fret... just **add** the femur correction amount to the measured difference instead of subtracting (keeping in mind your signs: adding a negative is the same as subtracting) and you should get the same answer.
- 27 ☐ Will I use a heel lift?  
The answers to the following questions should be yes to do so
- 28 ☐ The questions  
Is the AD greater than 6 (i.e. 7+) mm?  
Is the convexity of the spine to the side of the short leg?  
Is the body rotation of the lumbar spine toward the short leg?