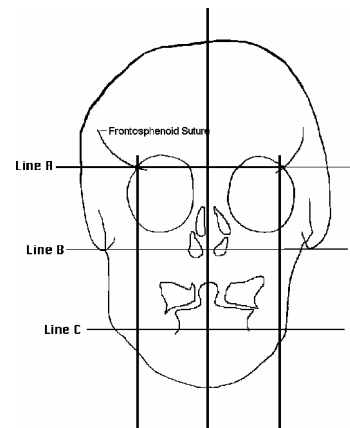
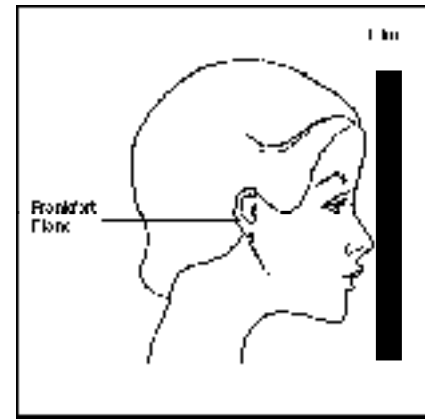




INSTRUCTIONS FOR QUALITY PA SKULL (FRONTAL) RADIOGRAPHS

1. Adjust your x-ray control to the highest **KVP** and **MA** available.
2. Adjust your exposure time according to the schedule on the following page (based on Imaging Systems-400/Lanex Regular screens and OGA film). Density must be adequate to clearly visualize the sutures in the skull. These sutures are your “density barometers”. Increase the time as necessary for increased density (ie. to darken the image).
3. Adjust the collimator and cassette holder for the 10x8 vertical format.
4. **Center** a fresh cassette into the cassette holder in the 10x8 vertical position. The height of the cassette holder must be such as to incorporate both the top of the skull and chin.
5. Adjust the cephalostat for the **PA** or **Frontal** position and lock.
6. Seat (position) and shield the patient in a natural posture with the lead apron positioned over the patient’s back.
7. With the patient’s **Frankfort Plane parallel with the floor**, bring the cassette in to slight contact with the tip of the patient’s nose.
8. Instruct the patient to “bite firmly on their back teeth and hold”.
9. Expose per the exposure chart below.
10. For proper density and resolution, process in automatic processors at a CONFIRMED 83°F (28.3°C) for 5.5 minutes using only **IMAGING SYSTEMS’ AUTOCHEM PRE-MIXED** or Kodak Readymatic developer and fixer. Use Kodak GBX for manual tanks at 68°F for 5 minutes (fix for a maximum of 4 minutes).



**Suggested Exposure Guidelines for PA Skull Radiographs using
Imaging Systems-400 Rare Earth/ Lanex Regular Intensifying Screens/Clear Image™
OGA Film**

Focal Spot to Mid-sagittal plane: 60 in

Exposure Time in impulses (60 impulses in 1 sec.)

KVP	90	90	80	80	70	70	70	65	65	60	55
MA	15	10	15	10	15	10	7	15	10	10	7
CHILD	24	32	38	51	60	80	85	76	1.7 sec	2.2 sec	3 sec
ADULT	36	48	57	76	90	2 sec	2.2 sec	1.9 sec	2.5 sec	3.3 sec	4 sec
LARGE ADULT	48	63	76	1.7 sec	2 sec	2.6 sec	2.8 sec	2.5 sec	3.4 sec	4.4 sec	4.8 sec

* Use of Kodak TMAT-H film will reduce the above exposure time by 1/2 but will result in grainier appearance

Conversion Chart for Fractions/Decimals to Impulses:

FRACTIONS DECIMALS IMPULSES

1/60	-----	-----	1	
1/20	-----	0.05	-----	3
1/15	-----		-----	4
1/10	-----	0.10	-----	6
2/15	-----		-----	8
3/20	-----	0.15	-----	9
1/5	-----	0.20	-----	12
1/4	-----	0.25	-----	15
3/10	-----	0.30	-----	18
7/20	-----	0.35	-----	21
2/5	-----	0.40	-----	24
9/20	-----	0.45	-----	27
1/2	-----	0.50	-----	30
11/20	-----	0.55	-----	33
3/5	-----	0.60	-----	36
13/20	-----	0.65	-----	39
7/10	-----	0.70	-----	42
3/4	-----	0.75	-----	45
4/5	-----	0.80	-----	48
17/20	-----	0.85	-----	51
9/10	-----	0.90	-----	54
19/20	-----	0.95	-----	57
1	-----	1.00	-----	60
1-1/4	-----	1.25	-----	75
1-1/2	-----	1.50	-----	90

**Suggested Exposure Guidelines for Cephalograms using
Dr. Goos/ISI Wicor-400 Rare Earth/Lanex Regular Intensifying Screens/ *Clear Image™* OGA Film**

Focal Spot to Mid-sagittal plane: 60 in

Exposure Time in impulses (60 impulses in 1 sec.)

KVP	90	90	80	80	70	70	70	65	65	60	55
MA	15	10	15	10	15	10	7	15	10	10	7
CHILD	13	17	16	21	24	30	36	24	36	53	70
ADULT	16	21	19	25	36	51	60	48	60	55	90
LARGE ADULT	19	25	22	29	48	60	75	60	75	78	2.3sec

* Use of Kodak TMAT-H film will reduce the above exposure time by 1/2 but will result in grainier appearance

Conversion Chart for Fractions/Decimals to Impulses

FRACTIONS DECIMALS IMPULSES

1/60 -----		----- 1	11/20 -----	0.55 -----	-33
1/20 -----	0.05	-----3	3/5 -----	0.60 -----	-36
1/15 -----		-----4	13/20 -----	0.65 -----	-39
1/10 -----	0.10	-----6	7/10 -----	0.70 -----	-42
2/15 -----		-----8	3/4 -----	0.75 -----	-45
3/20 -----	0.15	-----9	4/5 -----	0.80 -----	-48
1/5 -----	0.20	-----12	17/20 -----	0.85 -----	-51
1/4 -----	0.25	-----15	9/10 -----	0.90 -----	-54
3/10 -----	0.30	-----18	19/20 -----	0.95 -----	-57
7/20 -----	0.35	-----21	1 -----	1.00 -----	-60
2/5 -----	0.40	-----24	1-1/4 -----	1.25 -----	-75
9/20 -----	0.45	-----27	1-1/2 -----	1.50 -----	-90
1/2 -----	0.50	-----30			

CEPHALOMETRIC QUALITY ASSURANCE CHECKLIST

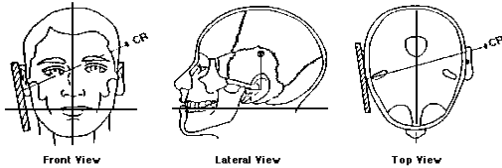
1. Absence of Hypo (wavy, flat black matte appearance).
2. Lead Letters must be in the image (the word/letter LEFT/L if the left cheek is against the cassette)
3. Absence of a lead apron, necklace and/or ear rings, etc. in the image.
4. Lambdoidal suture must be clearly evident (your "density barometer").
5. Frankfort Plane must be parallel with the floor.
6. Adequate soft tissue profile.
7. Single inferior border of the mandible indicating either mid-sagittal plane symmetry or facial asymmetry.
8. "Natural" lordotic curve (George's line).
9. 8-10mm spacing between cranial base and the spinous process of C1.
10. 6-8mm nasopharynx airway in the area of the posterior-superior aspect of the soft palate.

What else to look for on a LATERAL CEPHALOGRAM / LATERAL CERVICAL SPINE

1. Pharyngeal airway in area of soft palate.
2. Spatial relationship of C1 to cranial base.
3. Cervical spine contours.
4. Elevation of hyoid bone.
5. Anti-gonial notching (aka. bone deposition at the gonial angle).
6. Ossification of stylohyoid ligament.

THE TRANSCRANIAL RADIOGRAPH

Figure 2.

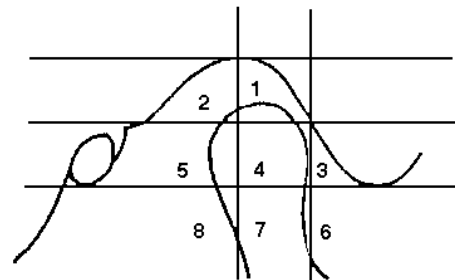


Reprinted from "TMJ Radiography with Emphasis on Tomography", H. M. Rosenberg, Dental Radiography and Photography - Kodak, Vol. 55, No.1, 1982.

The plain film Transcranial projection is based on directing the X-ray's primary beam down approximately 30° Transcranially through a "window" in the skull and in line with a point approximately 2" behind the opposite ear in order to project the beam down the long axis of the opposite condyle. All Transcranial techniques must be similarly positioned in order to avoid the dense anatomy of the base of the skull and to position the long axis of the subject condyle at the end of this "window". The Accurad-200 head positioner merely locks the patient into this relationship with your x-ray tube for consistent results.

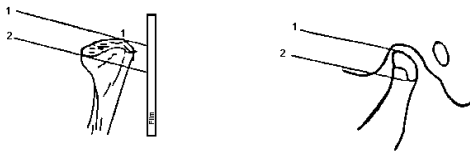
The Transcranial projection is primarily used in screening for "relative" condylar joint position within the glenoid fossa. Are the condyles positioned in the center of their respective fossa; posterior, superior or anterior? Is one condyle positioned further posterior or superior than the other? Do these findings correlate with your clinical evaluation? Dr. Harold Gelb has expanded upon this thesis with a grid to orient condylar position and concludes that the majority of asymptomatic condyles fall within this "4-7" position. Although most of today's leading clinicians feel that the asymptomatic condyle should be either concentrically positioned or in the 4-7 position, the most important determinant is FUNCTION.

Figure 4.



Reprinted from Clinical Management of Head, Neck and TMJ Pain and Dysfunction Philadelphia, W.B. Saunders.

Figure 3.



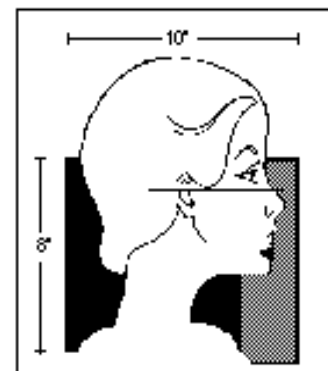
Reprinted from Advanced TMJ: Level 1, Diagnosis to Splint Construction.
Brendan Stack, D.D.S.

With the 30° Transcranial projection, the lateral pole of the condyle being radiographed is projected at 12 O'clock (1) and the medial pole at approximately 6 O'clock (2). This is contrary to the panoramic projection whereby the primary beam is projected "up" at 15° placing the *medial* pole at 12 O'clock and the *lateral* pole superimposed over the ascending ramus at 6 O'clock. Unfortunately, an estimated 93% of the osteoarthritic degeneration found in the TMJ occurs on the lateral pole and opposing fossa surface which supports the validity of the Transcranial projection for viewing the lateral pole and explains why the panoramic projection is of little use for evaluation of subtle degenerative changes.



TECHNIQUE FOR LATERAL CERVICAL SPINE RADIOGRAPHS

1. Adjust your X-ray control to the highest KVP and MA available.
2. Adjust your exposure time according to the schedule on the following page (based on Dr. Goos' graduated, ISI Wicor-400 or Lanex Regular screens and *TMAT-G™* OGAfilm). Density must be adequate to clearly visualize the lambdoidal suture in the back of the skull and the vertebral bodies. This suture is your "density barometer". Increase/decrease the time as necessary.
3. Adjust the collimator and cassette holder for the 8x10 horizontal format.
4. Seat (position) and shield the patient in their natural posture. Duplicate their natural "plumb-line" (center of shoulder to center of hip) and cervical posture. Observe the relationship of the ear hole to this plumb-line and duplicate.
5. The patient must answer "NO" to the following four questions:
 - (A). Do you feel as if you are stretched up?
 - (B). Do you feel as if you are slouched?
 - (D). Do you feel as if you are leaning forward?
6. Open the cassette holder as to allow the cassette to drop down 1-2" below the top of the patient's shoulder. It may be necessary to:
 - a. Open the ear pieces to their maximum
 - b. Instruct the patient to shift their buttock (if seated) or position their feet so as to orient themselves to the outside earpiece for stability
 - c. Raise the patient or lower the cephalostat so that the top of the patient's head comes in to light contact with the bottom of the cephalostat. *This has the net effect of dropping the cassette holder down 1-2" below the patient's shoulder.*
7. For systems NOT utilizing the Dr. Goos graduated intensifying screens or filtration at the beam source, adjust the soft tissue shield according to the figure 1. Block type shields must be flush with the edge of the cassette with the cassette and shield moved anteriorly/posteriorly as an assembly keeping the tip of the nose 1" in from the edge.
8. Position the patient's Frankfort Plane (ear piece to orbitale, most inferior surface of the orbit) Parallel With The Floor.
9. Guide the patient into the desired occlusal and lip position and expose.
10. For proper density and resolution, process in automatic processors at a CONFIRMED 83°F (28.3°C) for 5.5 minutes using only **IMAGING SYSTEMS' AUTOCHEM PRE-MIXED** developer and fixer or in Manual tanks at 68°F for 5 minutes using Kodak GBX solutions (fix for a maximum of 4 minutes).



**Suggested Exposure Guidelines for the Lateral Cervical Spine using
ISI Wicor-400 Rare Earth/Lanex Regular Intensifying Screens/Clear Image™ OGA Film**

Focal Spot to Mid-sagittal plane: 60 in

Exposure Time in impulses (60 impulses in 1 sec.)

KVP	90	90	80	80	70	70	70	65	65	60	55
MA	15	10	15	10	15	10	7	15	10	10	7
CHILD	13	17	16	21	24	30	36	24	36	53	70
ADULT	16	21	19	25	36	51	60	48	60	75	90
LARGE ADULT	19	25	22	29	48	60	75	60	75	90	2.3sec

* Use of Kodak TMAT-H film will reduce the above exposure time by 1/2 but will result in grainier appearance

Conversion Chart for Fractions/Decimals to Impulses

FRACTIONS	DECIMALS	IMPULSES
1/60 -----		----- 1
1/20 -----	0.05	-----3
1/15 -----		-----4
1/10 -----	0.10	-----6
2/15 -----		-----8
3/20 -----	0.15	-----9
1/5 -----	0.20	-----12
1/4 -----	0.25	-----15
3/10 -----	0.30	-----18
7/20 -----	0.35	-----21
2/5 -----	0.40	-----24
9/20 -----	0.45	-----27
1/2 -----	0.50	-----30
		11/20 -----0.55-----33
		3/5 -----0.60 -----36
		13/20 -----0.65-----39
		7/10 -----0.70-----42
		3/4 -----0.75-----45
		4/5 -----0.80-----48
		17/20 -----0.85----- 51
		9/10 -----0.90-----54
		19/20 -----0.95----- 57
		1 -----1.00-----60
		1-1/4 -----1.25-----75
		1-1/2 -----1.50-----90

LATERAL CERVICAL SPINE QUALITY ASSURANCE CHECKLIST

1. Absence of Hypo (wavy, flat black matte appearance).
2. Lead Letters must be in the image (the word/letter LEFT/L if the left cheek is against the cassette)
3. Absence of a lead apron, necklace and/or ear rings, etc. in the image.
4. Lambdoidal suture must be clearly evident (your "density barometer").
5. Frankfort Plane must be parallel with the floor.
6. Adequate soft tissue profile.
7. Single inferior border of the mandible indicating either mid-sagittal plane symmetry or facial asymmetry.
8. "Natural" lordotic curve (George's line).
9. 8-10mm spacing between cranial base and the spinous process of C1.
10. 6-8mm nasopharynx airway in the area of the posterior-superior aspect of the soft palate.

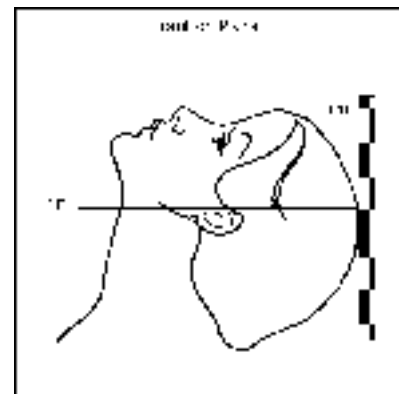
What else to look for on a LATERAL CERVICAL SPINE

1. Pharyngeal airway in area of soft palate.
2. Spatial relationship of C1 to cranial base.
3. Cervical spine contours.
4. Elevation of hyoid bone.
5. Anti-gonial notching (aka. bone deposition at the gonial angle).
6. Ossification of stylohyoid ligament.



TIPS FOR QUALITY SUBMENTAL VERTEX RADIOGRAPHS

1. Adjust your x-ray control to the highest KVP and MA available.
2. Adjust your exposure time according to the schedule on the following pages (based on ISI Wicor-400/ Lanex Regular screens and *Clear Image™* OGA film). Density must be adequate to clearly visualize the mandibular condyles and cervical spine. Increase/decrease the time as necessary.
3. Adjust the collimator and cassette holder for the 8x10 horizontal format. Adjust the cassette holder posteriorly to its stop.
4. Adjust the cephalostat to the AP/Frontal position and lock.
5. Install 1/4" thick lead washers (Imaging Systems) over the ear pieces (to be utilized in the tracing procedure). Attach lead letters "R" and "L" to the cassette with self adhesive velcro.
6. Position and center a chair/stool approximately 12" in front of the cephalostat.
7. Seat and CENTER the patient. Adjust the seat up or the cephalostat down to a point where the patient's ear holes are a level approximately 3-4" above the level of the ear pieces.
8. If using a lead apron, it must be kept below the patient's chest.
9. Align and position the patient's torso and head directly in front of the ear pieces. The patient's head should now be positioned approximately 8-10" directly in front of the ear pieces.
10. With one hand FIRMLY in the patient's lumbar and other hand supporting their head, guide the patient back into a "back-dive" position until their FRANKFORT PLANE is PERPENDICULAR with the floor. Take a visual reference as to the height of their ear holes to the ear pieces. Advise the patient to "slouch down" and come forward.
11. Readjust the chair or cephalostat accordingly.
12. Once again with one hand FIRMLY in their lumbar and the other hand supporting their head, guide the patient back into the "back-dive" until their Frankfort Plane is at least perpendicular with the floor. Note: If the Frankfort Plane is not perpendicular, the gonial angles will obscure the condyles.
13. With the ear pieces now in line with the ear holes, support their head, guide the ear pieces into the ear holes and secure.



14. Bring the cassette holder in contact with the patient's head for additional support.
15. Adjust the patient's head to eliminate any rotation and/or angulation.
16. Advise the patient to clench and expose.
17. Immediately release the ear supports and with your hand as head support, instruct the patient to "slouch down and come forward".
18. Remove the lead washers from the ear support.

**Suggested Exposure Guidelines for Submental Vertex Radiographs using
ISI Wicor-400 Rare Earth/Lanex Regular Intensifying Screens/Clear Image™ OGA Film**

Focal Spot to Mid-sagittal plane: 60 in

Exposure Time in impulses (60 impulses in 1 sec.)

KVP	90	90	80	80	70	70	70	65	65	60
MA	15	10	15	10	15	10	7	15	10	10
CHILD	28	40	36	52	60	92	124	76	116	152
ADULT	36	52	48	68	80	124	164	100	156	208
LARGE ADULT	40	60	52	80	92	140	184	116	176	228

* Use of KodakTMAT-H film will reduce the above exposure time by 1/2 but will result in grainier appearance

Conversion Chart for Fractions/Decimals to Impulses:

FRACTIONS	DECIMALS	IMPULSES
1/60	-----	----- 1
1/20	----- 0.05	----- 3
1/15	-----	----- 4
1/10	----- 0.10	----- 6
2/15	-----	----- 8
3/20	----- 0.15	----- 9
1/5	----- 0.20	----- 12
1/4	----- 0.25	----- 15
3/10	----- 0.30	----- 18
7/20	----- 0.35	----- 21
2/5	----- 0.40	----- 24
9/20	----- 0.45	----- 27
1/2	----- 0.50	----- 30
11/20	----- 0.55	----- 33
3/5	----- 0.60	----- 36
13/20	----- 0.65	----- 39
7/10	----- 0.70	----- 42
3/4	----- 0.75	----- 45
4/5	----- 0.80	----- 48
17/20	----- 0.85	----- 51
9/10	----- 0.90	----- 54
19/20	----- 0.95	----- 57
1	----- 1.00	----- 60
1-1/4	----- 1.25	----- 75
1-1/2	----- 1.50	----- 90



A TMJ / ORTHODONTIC SCREEN RADIOGRAPHIC CHECKLIST -
What to look for

SUBMENTAL VERTEX -

1. Condylar morphology.
2. Relative condylar position to the horizontal baseline.
3. Mandibular asymmetry.
4. Odontoid process of C-2 spatial relationships.

LATERAL CEPHALOGRAM / LATERAL SKULL / LATERAL CERVICAL SPINE -

1. Pharyngeal airway in area of soft palate.
2. Spatial relationship of C1 to cranial base.
3. Cervical spine contours.
4. Elevation of hyoid bone.
5. Anti-gonial notching (aka. bone deposition at the gonial angle).
6. Elongated stylohyoid processes/ossification of the stylohyoid ligaments.

PA SKULL (Frontal) -

1. Relative height/symmetry of orbits.
2. Relative height/symmetry of mastoid processes.
3. Relative height/symmetry of gonial angles.
4. Midline symmetry of menton (symphysis).
5. Relative morphology of inferior, middle and superior nasal concha, turbinates.
6. Spatial relationships of C1 to C2.

PA TOWNES -

1. Condylar morphology.
2. Mandibular deviation.
3. Elongated stylohyoid processes/ossification of the stylohyoid ligaments.

SAGITTAL TOMOGRAMS OF THE TMJ (same for TRANSCRANIALS) -

1. Relative condylar position: Right vs. Left.
2. Spatial relationships in closed, rest, open, orthotic positions.
3. Relative size and shape of respective fossae.
4. Relative morphology; size, sclerosis, degenerative changes, etc.

AP CORONAL TOMOGRAM OF THE TMJ -

1. Relative condylar morphology.
2. Elongated stylohyoid processes/ossification of the stylohyoid ligaments.
3. Oblique C1 to C2 spatial relationships.

PARANASAL SINUS TOMOGRAM -

1. Relative morphology of inferior, middle and superior nasal turbinates.
2. Influence of concha and turbinates on left and right airway paths.