

Referring Veterinarian:  
DR NATHAN NELSON  
MICHIGAN STATE UNIVERSITY  
VETERINARY TEACHING HOSPITAL  
A-161 VMC  
EAST LANSING, MI 48824  
UNITED STATES

Patient ID: 462093  
Radiography Date: 10 Dec 2015

Owner/Responsible Person:  
TOM EVANS

Patient:	
Patient Name: NOVA	Species: CANINE
Reg. Name: THEVENET SUPERNOVA DELOSGRANDESLAGOS	Breed: GOLDEN RETRIEVER
Reg. #: Tattoo:	Date of Birth: 12 Feb 2015 Age: 10 mo.
Microchip: 941000017514977	Gender: F Weight: 41 lbs.

RESULTS			
LEFT	Distraction Index (DI)	<b>0.30</b>	DI is less than or equal to 0.30, with no radiographic evidence of OA.
	Osteoarthritis (OA)	<b>None</b>	
	Cavitation	<b>No</b>	
	Other Findings	Not Applicable	
RIGHT	Distraction Index (DI)	<b>0.39</b>	DI is greater than 0.30 with no radiographic evidence of OA. There is an increasing risk of developing OA as the DI increases; low risk when DI is close to 0.30, high risk when DI is close to 0.70 or above.
	Osteoarthritis (OA)	<b>None</b>	
	Cavitation	<b>No</b>	
	Other Findings	Not Applicable	

Please note that the PennHIP DI is a measure of hip joint laxity, it does not allude to a "passing" or "failing" hip score.

LAXITY PROFILE RANKING										
The laxity profile ranking is based on the hip with the greater laxity (DI). This interpretation is based on a cross-section of 15,997 CANINE animals of the GOLDEN RETRIEVER breed. The median DI for this group is 0.54.										
Percentiles										
	90th	80th	70th	60th	50th	40th	30th	20th	10th	
> 90th					Median					< 10th
	↑									
The chart above indicates the ranking of your animal's passive hip laxity (DI) in relation to all CANINE animals of the GOLDEN RETRIEVER breed in our database. This result means that 1) your animal's hips are tighter than approximately 90% of this group of animals (alternatively, 10% of the group has tighter hips than your animal), and 2) your animal's hip laxity is in the tighter half of the laxity profile. Breed-specific evaluations are analyzed semi-annually. Consequently, the average laxity and range of laxity for any given group will change over time.										

PennHIP does not make specific breeding recommendations. Selection of sire and dam for mating is the decision of the breeder.

**NOTE: As a minimum breeding criterion, we propose that breeding stock be selected from the population of animals having hip laxity in the tighter half of the breed (to the left of the median mark on the graph). Higher selection pressure equates to more rapid expected genetic change per generation.**

By implementing selection based on passive hip laxity, we expect the breed average DI over the years to move toward tighter hip configuration, meaning lower hip dysplasia susceptibility. The PennHIP database permits scientific adjustment of criteria to reflect these shifts; the average laxity and range of laxity for a particular breed will change over time.



**PennHIP**

Member:  
**NATHAN NELSON**

PennHIP Reference #:  
**925025**

Report Date:  
**16 Dec 2015**

## **RADIOGRAPH EVALUATION COMMENTS**

Original Report Date: 15 Dec 2015

On 16 Dec 2015:

As per clinic request, updated reg. name to Thevenet Supernova DeLosGrandesLagos and re-issued report.

## REVIEW FORM

Review all films for quality and bilateral distraction before the dog is recovered from anesthesia.

A. Lack of sufficient distraction is the most common reason for requesting re-radiography.

1. All hips have some measurable laxity. Compare the compression and hip-extended views to ensure you detect more laxity on the distraction view. If one or both hips appear to have minimal to no distraction, make the necessary adjustments and repeat until you can detect a *visible difference bilaterally*. Submit all films, numbered in the order taken.

2. The distractor should be *centered* on the dog's midline and not shifted to the right or left.

On the finished x-ray, each femoral head should appear completely within the shadow of each plexi-glass rod. Usually, at this spacing the stifles are at stance-phase distance apart when maximal distraction force is being applied. If rods are too widely or too closely spaced, adjust and repeat.

If *thigh musculature is superimposing* a portion of either femoral head on the film, widen the distractor rods (or center the distractor better) and repeat.

For ideal rod positioning see illustration #6 in newer PennHIP training manual (post 1996) and training video.

3. Femurs should be at right angles (i.e. perpendicular) to the table surface from the lateral perspective and not pulled too caudally (hips extended) or pushed too cranially (hips flexed) as this can decrease distraction. Empirically, we suspect that when the femurs are too caudal, cavitation can occur.

Tibias should be parallel to each other and to the x-ray table surface to prevent internal/external hip rotation.

Stifles should be at approximately 90° flexion and approximately stance-phase distance apart when exerting maximal distraction force.

4. Look on the distraction film for indentation of the rubber covering the distractor rods. The rubber is observed as a radiolucent, linear area just

lateral to the rod shadows. Generally a 25-50% rubber indentation where the femurs apply pressure indicates that sufficient adduction force is being applied to the lower tibias (or hocks) during distraction. Less than 25% rubber indentation may cause us to reject the film. Greater than 50% may increase the probability of cavitation.

5. Check that the patient is adequately anesthetized so there is no reflex muscle activity preventing distraction. You should be able to pinch the dog's toes hard and get no withdrawal response.

6. For dogs whose distraction view appears very "tight", palpate hip using Barden's maneuver. If you can palpate laxity it should be readily visible on the distraction view, so repeat the radiograph (see #8 below).

7. Make sure the pubis is centered on the film and under the "crosshairs" of the central beam. This will prevent distortion of the measurement landmarks.

8. When the hips appear very tight, repeat the distraction view. Be especially certain anesthesia level is sufficient (see A-5). (Also, see A-6.) Submit at least two distraction films to prove tightness. Reports cannot be generated for patients where insufficient or no distraction was obtained and you will be requested to re-radiograph the dog.

B. Check the radiographs for quality and legible patient information

1. Accurate PennHIP measurements require precise identification of key orthopedic landmarks. Good radiographic technique and film developing are essential so that reliable measurements can be obtained. Under- or over-exposed films will be rejected.

2. Make sure the patient information and the side markers are clearly visible. Missing or unclear information may be handwritten with a permanent marker if necessary. At minimum, patient information should include the dog's name or registration no. as it appears on the application, owner's name and date of radiography.

C. See separate “Cavitation” sheet

D. The presence of moderate to severe DJD can result in less than maximal distraction due to remodeling changes that prevent lateral translation of the hip. This can explain a report with the presence of moderate/severe DJD yet a “good” DI. In some cases, a DI is not generated because it is judged to be inaccurate due to remodeling changes.

*Review your Training Manual and videotape for additional discussion of these points. If you need technical assistance on this case call the PennHIP Analysis Center at 800-PENNHIP (736-6447).*

E. Thank you for submitting this case. Hips with osteoarthritis (OA) are just as important to the AIS PennHIP database as hips without OA. The database must contain a true representation of the full range of phenotypes, including hips with severe laxity, with or without OA, and hips with all degrees of OA: Mild, Moderate, and Severe. If hips with OA are preferentially not submitted, this creates bias in the database and it becomes difficult to accurately assess whether genetic progress is being made over time..