# EQUINE MUSCULOSKELETAL RADIOGRAPHY

## Digital Radiography: Non-Standard Radiographic Projections for Equine Musculoskeletal Imaging

Alex Valdés, MVZ, DACVR

Assistant Professor of Diagnostic Imaging

Dept. Environmental and Radiological Health Sciences

Colorado State University

College of Veterinary Medicine

## Metacarpo- or metatarso-phalangeal joint

### 1.- Flexed dorsoproximal-dorsodistal projection (skyline):

This radiographic projection is obtained for evaluation of the articular surface of the MCIII or MTIII condyles.

Technique: The fetlock joint is flexed and the limb positioned as forward as possible. The x-ray detector is placed under the flexed joint and parallel to the ground. The x-ray beam is angled 45-70º and aimed to the sagittal ridge.

### 2.- Lateroproximodorsal-mediodistopalmar oblique projection (double oblique):

This radiographic projection is also obtained from medial to lateral (medioproximodorsal-laterodistopalmar) and is useful for evaluation of the medial and lateral dorsal margins of the articular fovea and the plantar processes of P1 and the base of the sesamoid bones.

Technique: The x-ray beam is angled lateral 20ºproximal, 20ºdorsal. Greater angles can be used to achieve greater separation of the sesamoid bones.

# Carpus

Three flexed dorsoproximal-dorsodistal (skyline) projections can be obtained with different degrees of x-ray beam angulation for evaluation of the distal radius, proximal row of carpal bones or distal row of carpal bones.

In all projections, the detector is positioned parallel to the ground and under the carpus.

## 1.- Flexed dorsoproximal-dorsodistal projection for evaluation of the distal radius.

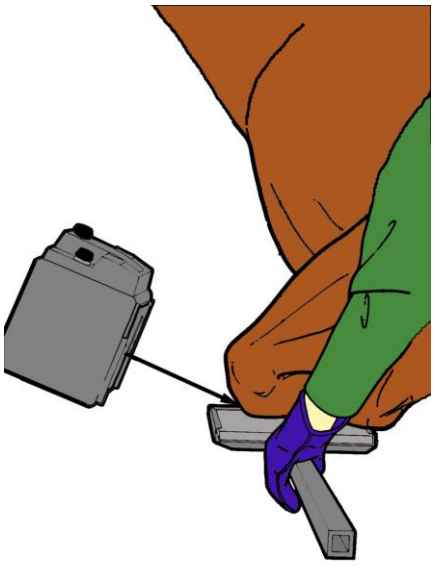
Technique: The carpus is flexed as much as possible and the limb pulled back trying to position the radius close to perpendicular to the ground. The x-ray beam is angled approximately 80º to the ground.

## 2.- Flexed dorsoproximal-dorsodistal projection for evaluation of the proximal row of carpal bones.

Technique: The carpus is flexed and projected forward. The x-ray beam is angled approximately 55º to the ground.

## 3.- Flexed dorsoproximal-dorsodistal projection for evaluation of the distal distal row of carpal bones.

Technique: The carpus is flexed and projected further forward so the radius is positioned approximately 45º from the ground. The x-ray bream is angled approximately 30º to the ground.



## Shoulder

### 1.- Flexed cranioproximal-craniodistal (skyline) of the humeral tubercles:

This radiographic projection is obtained for evaluation of the humeral tubercles free of superimposition with each other.

Technique: The limb is flexed as much as possible and the head is turned to the weight bearing side. The detector is positioned as far caudal as possible under the humeral tubercles and parallel to the ground. The x-ray beam is angled 90º (perpendicular) to the ground and centered over the point of the shoulder.

## Tarsus

### 1.- Flexed dorso-plantar (skyline) projection of the calcaneus:

This radiographic projection is used for evaluation of the calcaneus free of superimposition with other bones. This is the best projection for evaluation of the sustentaculum tali.

Technique: The tarsus is flexed with the metatarsus positioned parallel to the ground. The detector is placed in contact with the plantar surface of the tarsus and proximal MTIII. The x-ray beam is angled 90º (perpendicular) to the ground.

### 2.- Flexed latero-medial projection:

This radiographic projection is obtained for evaluation of the weight bearing surface of the trochlea ridges of the talus that are superimposed over the tibial malleoli and distal intermediate ridge of the tibia.

Technique: The tarsus is flexed and the detector placed on the medial aspect. The x-ray beam is directed parallel to the ground. The practitioner should be aware that abduction or adduction of the flexed limb will result in obliquity of the projection.

# Stifle

## 1.- Flexed latero-medial projection:

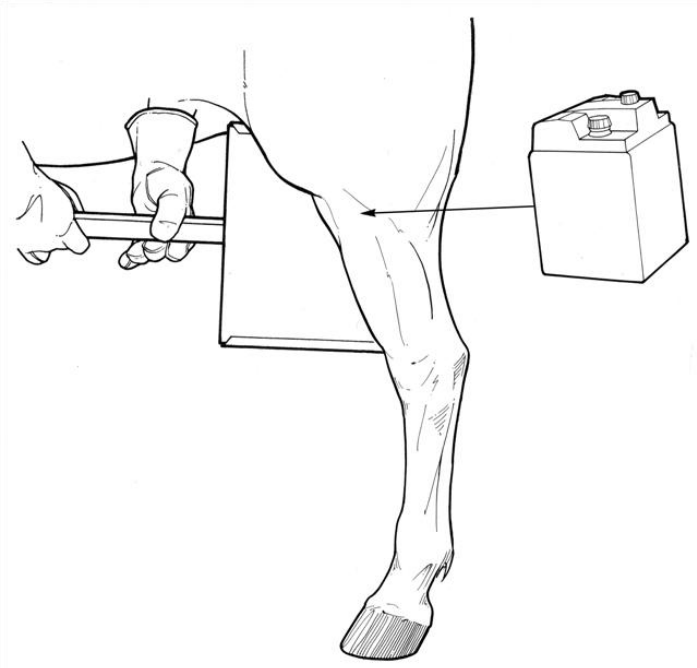
This radiographic projection is used for evaluation of the weight bearing articular surface of the medial femoral condyle (cranial aspect of the femoral condyle) free of superimposition with the tibial eminences and the lateral femoral condyle.

Technique: The stifle is flexed and if possible a mild abduction is applied. The x-ray beam is directed parallel to the ground. A 20º cranial angulation may be helpful to isolate the medial femoral condyle. If abduction is not possible, then the x-ray beam is directed lateral 10ºdistal to medioproximal.

## 2.- Laterocaudal-craniomedial projection:

This projection is used for evaluation of the medial femoral condyle free of superimposition with the tibial eminences and the lateral femoral condyle.

Technique: The x-ray beam is directed parallel to the ground, but angled lateral 45-60ºcaudal to craniomedial. The detector is placed on the medial aspect of the stifle.



## 3.- Flexed cranioproximal-craniodistal (skyline) projection of the patella:

This projection is obtained for evaluation of the entire patella including the medial and lateral articular surfaces.

Technique: The limb is flexed with the tibia almost parallel to the ground in a position similar to the one used for shoeing or placing a nerve block in the distal limb. The detector is placed parallel to the ground in contact with the proximal tibia and the x-ray beam angled 90º (perpendicular) to the round.