Basic principles of radiation protection:

1. JUSTIFICATION

Before an X-ray examination takes place, the principle of justification needs to be respected. The veterinarian has to consider if an X-ray examination is necessary in order to obtain the desired result. Once this has been established, the need for an off-site examination should be evaluated.

2. OPTIMISATION

For the examination itself, the principle of optimisation should be respected by taking following parameters into account:

1. Maximising distance
2. Minimising time
3. Use of adequate shielding

Some knowledge about ionising radiation is necessary in order to understand the exposure of the participants during X-ray examinations. The primary beam is produced by the X-ray generator and constitutes the radiation used for imaging. When the primary beam hits the animal, scattered radiation with less energy than the primary beam is emitted in all directions. Protective equipment such as lead aprons and gloves effectively protect against this scattered radiation, but not as effective against the primary beam.

CONTACT INFORMATION

www.herca.org

HERCA
HEADS OF THE EUROPEAN RADIOLOGICAL PROTECTION COMPETENT AUTHORITIES

Veterinary Guidelines

for protection of veterinary professionals and members of the public during off-site x-ray examinations

Kørende Dyrlæge, Broager, Denmark

In veterinary practice, X-ray equipment is frequently used within the clinic but also outside in pastures or stables. The latter is considered *off-site* use of X-ray equipment and is commonly done when examining horses. These procedures are done with the help of mobile X-ray equipment. Unlike the use of X-rays within a veterinary clinic, where appropriate shielding and personal protective equipment is easily available, off-site use requires specific safety measures to ensure protection of all participants against ionising radiation during the exposures.

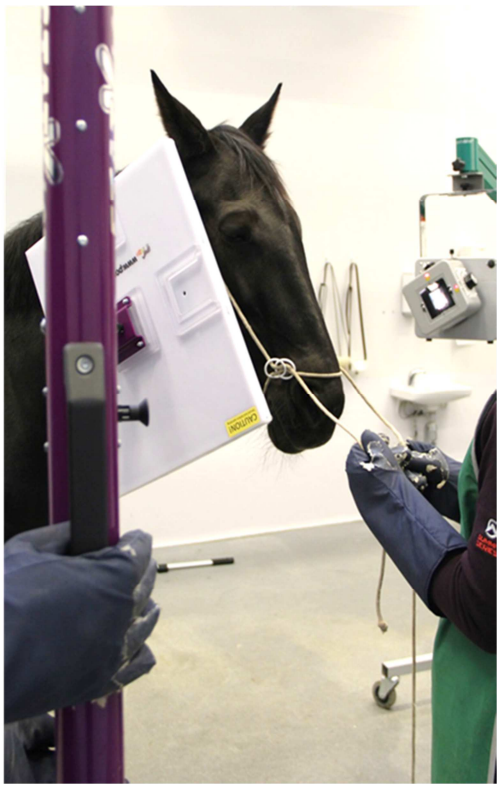
This leaflet describes the legal requirements and gives useful practical advice about radiation protection in an off-site setting.

Preparation of the intervention:

1. Evaluate the relevance of performing the examination off-site
2. Make sure to pack:
    - enough/ relevant personal protective equipment for everybody participating during the exams
    - equipment for setting up operating zone (demarcation and signs)
    - devices to reduce exposure risks (distance cassette holders, footrests, foldable stands to hold the device,…)
    - sedatives/restraint bars when relevant

On site: preparing the operating area

1. Favour horse boxes/stables over open-field
2. Choose a minimal traffic area with
- minimal traffic (no crossing point)
- the possibility to visualise the entire area
- architectural features offering radiation shielding
3. Setting up the operating zone with a visual demarcation



Universitetshospitalet for Store Husdyr, Taastrup, Denmark

Preparing the animal and the team

1. Evaluate the relevance of using sedatives or restraint bars
2. Limit the amount of people in the operating zone by excluding everyone not actively participating in the examination
3. Inform members of the public participating in the examination about the radiological risks and safety advice
4. Verify that all participants are provided with personal protective equipment and personal dosimeters (if required)
5. Verify that devices to reduce the exposure risk are used

Performing the X-ray examination

1. Optimise the position of the individuals participating in the exam
2. Optimise the number of radiographic images
3. Use optimised exposure parameters
4. Choose the direction of the beam, favouring aiming at the floor or a brick wall
5. Use the light field for positioning and to collimate of the beam to the right size
6. Use, if possible, an exposure cable to maximise the distance between the operator and the X-ray generator
7. In case of unintended events where the X-ray device might have been damaged, use the detector to identifying any radiation leakages

REGULATORY REQUIREMENTS
for the practitioner:

for the X-ray equipment