

# X-ray UCDLA\_XRY\_001

## Purpose

Construct and analyse digital X-ray images in immobilised mice using a Faxitron X-Ray system or NTB digital X-ray scanner.

## Experimental Design

- **Minimum number of animals** : 4M + 4F
- **Age at test**: Week 57

## Procedure

Perform steps 3.1 and 3.2 unless the mouse is coming from DEXA analysis

3.1 Anesthetize the mice.

3.2 Monitor the animal carefully until unconsciousness by ensuring the mouse is adequately sedated.

3.3 Mount the anesthetized mouse onto an X-ray permeable plate. Curve the tail along the left side of the mouse. (Note: this will enable identification of the X-ray as a dorsal or ventral image.)

Faxitron X-ray system

3.3.1 Insert the plate into the Faxitron X-ray system.

3.3.2 Take an image using the software that is supplied by the X-ray scanner.

3.3.3 Set the machine to a voltage of 25kV with an integration time of 40ms.

3.3.4 Take an image using the iX-Pect software that is supplied by the X-ray scanner.

NTB digital X-ray scanner

3.4 Remove the mouse once the image is captured. Place the mouse on a heated mat, set at 37°C, in a cage and monitor closely until consciousness is fully regained.

3.5 Analyze the image.

3.6 Or continue with ABR.

# Notes

The protocol described herein employs anaesthesia using intraperitoneal (IP) administration; however, anaesthesia using isoflurane is also suitable.

[Digit integrity IMPC\\_XRY\\_031\\_001](#) *Definition:* The state of being whole and undivided.

## Parameters and Metadata

### Skull shape UCDLA\_XRY\_001\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: true      Is Annotated: true

Description: skull\_shape

Options: normal, abnormal, imageOnly, unobservable,

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### Zygomatic bone UCDLA\_XRY\_002\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: true      Is Annotated: true

Description: zygomatic\_bone

Options: normal, abnormal, imageOnly, unobservable,

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### Maxilla/Pre-maxilla UCDLA\_XRY\_003\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** maxilla

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Mandibles** UCDLA\_XRY\_004\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** mandibles

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Teeth** UCDLA\_XRY\_005\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** teeth

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Scapulae** UCDLA\_XRY\_006\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** scapulae

**Options:** normal, abnormal, imageOnly, unobservable,

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## Clavicle UCDLA\_XRY\_007\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** clavicle

**Options:** normal, abnormal, imageOnly, unobservable,

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## Number of ribs right UCDLA\_XRY\_008\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_ribs\_right

---

## Number of ribs left UCDLA\_XRY\_009\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_ribs\_left

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## Shape of ribs UCDLA\_XRY\_010\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** shape\_of\_ribs

**Options:** normal, abnormal, imageOnly, unobservable,

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## Fusion of ribs UCDLA\_XRY\_011\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fusion\_of\_ribs

**Options:** not fused, fused, imageOnly, unobservable,

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## Pelvis UCDLA\_XRY\_012\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** pelvis

**Options:** normal, abnormal, imageOnly, unobservable,

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**Number of cervical vertebrae** UCDLA\_XRY\_013\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_cervical\_vertebrae

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**Number of thoracic vertebrae** UCDLA\_XRY\_014\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_thoracic\_vertebrae

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**Number of lumbar vertebrae** UCDLA\_XRY\_015\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_lumbar\_vertebrae

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**Number of pelvic vertebrae** UCDLA\_XRY\_016\_001 | v1.0

simpleParameter

**Req. Analysis:** false      **Req. Upload:** false      **Is Annotated:** true

**Description:** number\_of\_pelvic\_vertebrae

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**Number of caudal vertebrae** UCDLA\_XRY\_017\_001 | v1.0

simpleParameter

**Req. Analysis:** false      **Req. Upload:** false      **Is Annotated:** true

**Description:** number\_of\_caudal\_vertebrae

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**Shape of vertebrae** UCDLA\_XRY\_018\_001 | v1.0

simpleParameter

**Req. Analysis:** false      **Req. Upload:** true      **Is Annotated:** true

**Description:** shape\_of\_vertebrae

**Options:** normal, abnormal, imageOnly, unobservable,

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## Fusion of vertebrae UCDLA\_XRY\_019\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fusion\_of\_vertebrae

**Options:** yes, no, imageOnly, unobservable,

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## Processes on vertebrae UCDLA\_XRY\_020\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** processes\_on\_vertebrae

**Options:** normal, abnormal, imageOnly, unobservable,

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## Humerus UCDLA\_XRY\_021\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** humerus

**Options:** normal, abnormal, imageOnly, unobservable,



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## Radius UCDLA\_XRY\_022\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** radius

**Options:** normal, abnormal, imageOnly, unobservable,

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## Ulna UCDLA\_XRY\_023\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** ulna

**Options:** normal, abnormal, imageOnly, unobservable,

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## Femur UCDLA\_XRY\_024\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** femur

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Tibia** UCDLA\_XRY\_025\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** tibia

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Fibula** UCDLA\_XRY\_026\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** fibula

**Options:** normal, abnormal, imageOnly, unobservable,

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## **Joints** UCDLA\_XRY\_027\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** joints

**Options:** normal, abnormal, imageOnly, unobservable,

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## Number of digits UCDLA\_XRY\_028\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Description:** number\_of\_digits

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## Syndactylism UCDLA\_XRY\_029\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** syndactylism

**Options:** no syndactylism, Syndactylism, imageOnly, unobservable,

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## Brachydactyly UCDLA\_XRY\_030\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** completeness\_of\_digits

**Options:** yes, no, imageOnly, unobservable,

---

## Digit integrity UCDLA\_XRY\_031\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Description:** digit\_integrity

**Options:** yes, no, imageOnly, unobservable,

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## Comment on XRay image UCDLA\_XRY\_032\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** comment\_on\_xray\_image

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## Tibia length UCDLA\_XRY\_033\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Unit Measured:** mm

**Description:** tibia\_length

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## XRay Images Whole Body Dorso Ventral UCDLA\_XRY\_034\_001 | v1.0

seriesMediaParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: xray\_images

Increments: Minimum 1

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## Alive UCDLA\_XRY\_035\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: alive

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## Xray equipment ID UCDLA\_XRY\_036\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: xray\_equipment\_name

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# Xray equipment manufacturer UCDLA\_XRY\_037\_001 | v1.0

procedureMetadata

Req. Analysis: true                      Req. Upload: false                      Is Annotated: false

Description: xray\_equipment\_manufacturer

Options: Faxitron X-Ray Corporation, Rigaku Corporation (Micro-CT), Bruker, Faxitron Bioptics LLC, Scintica,

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# Xray equipment model UCDLA\_XRY\_038\_001 | v1.0

procedureMetadata

Req. Analysis: true                      Req. Upload: false                      Is Annotated: false

Description: xray\_equipment\_model

Options: MX-20-DC12, MX-20-DC4, R\_mCT (Micro-CT), MX-20, MS-FX Pro, UltraFocus 100, UltraFocus DXA, Insight-VET-DXA,

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# Settings time of exposure UCDLA\_XRY\_039\_001 | v1.0

procedureMetadata

Req. Analysis: false                      Req. Upload: true                      Is Annotated: false

Unit Measured: s

Description: settings\_time\_of\_exposure

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## Settings level UCDLA\_XRY\_040\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: settings\_level

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## Experimenter ID (scan) UCDLA\_XRY\_041\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: experimenter\_scan\_

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## Experimenter ID (analysis) UCDLA\_XRY\_042\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: experimenter\_analysis\_

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## Voltage settings UCDLA\_XRY\_043\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: voltage\_settings

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**Scanner equipment ID** UCDLA\_XRY\_044\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: scanner\_equipment\_name

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**Scanner equipment manufacturer** UCDLA\_XRY\_045\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: scanner\_equipment\_manufacturer

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**Scanner equipment model** UCDLA\_XRY\_046\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: scanner\_equipment\_model



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## Date Xray equipment last calibrated UCDLA\_XRY\_047\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## XRay Images Whole Body Lateral Orientation UCDLA\_XRY\_048\_001 | v1.0

seriesMediaParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Increments: Minimum 1

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## XRay Images Forepaw UCDLA\_XRY\_049\_001 | v1.0

seriesMediaParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Increments: Minimum 1

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## XRay Images Skull Lateral Orientation UCDLA\_XRY\_050\_001 | v1.0

seriesMediaParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: false

Increments: Minimum 1

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## XRay Images Skull Dorso Ventral Orientation UCDLA\_XRY\_051\_001 | v1.0

seriesMediaParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: false

Increments: Minimum 1

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## XRay Images Hind Leg and Hip UCDLA\_XRY\_052\_001 | v1.0

seriesMediaParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: false

Increments: Minimum 1

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## Date Scanner equipment last calibrated UCDLA\_XRY\_053\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

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## Free Ontology UCDLA\_XRY\_054\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

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## Shape of spine UCDLA\_XRY\_055\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** normal, abnormal, imageOnly, unobservable,

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## Scoliosis UCDLA\_XRY\_056\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** yes, no, imageOnly, unobservable,

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# Kyphosis UCDLA\_XRY\_057\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: true

Options: yes, no, imageOnly, unobservable,

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# Lordosis UCDLA\_XRY\_058\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: true

Options: yes, no, imageOnly, unobservable,

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# Shape of ribcage UCDLA\_XRY\_059\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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# Transitional vertebrae UCDLA\_XRY\_060\_001 | v1.0

simpleParameter

Req. Analysis: false      Req. Upload: false      Is Annotated: true

**Options:** yes, no, imageOnly, unobservable,

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**Fusion of processes** UCDLA\_XRY\_061\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** yes, no, imageOnly, unobservable,

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**Polysyndactylism** UCDLA\_XRY\_062\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** yes, no, imageOnly, unobservable,

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**Cervical processes** UCDLA\_XRY\_063\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** normal, abnormal, imageOnly, unobservable,

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## Thoracic processes UCDLA\_XRY\_064\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Lumbar processes UCDLA\_XRY\_065\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Sacral processes UCDLA\_XRY\_066\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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## Caudal processes UCDLA\_XRY\_067\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** normal, abnormal, imageOnly, unobservable,

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## Missing cranial rib UCDLA\_XRY\_068\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Options:** Yes, No,

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## Rib morphology UCDLA\_XRY\_069\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** normal, unobservable, abnormal, imageOnly,

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## Cervical vertebrae morphology UCDLA\_XRY\_070\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Options:** abnormal, imageOnly, unobservable, normal,

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## Thoracic vertebrae morphology UCDLA\_XRY\_071\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: unobservable, abnormal, normal, imageOnly,

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## Lumbar vertebrae morphology UCDLA\_XRY\_072\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: imageOnly, normal, abnormal, unobservable,

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## Pelvic vertebrae morphology UCDLA\_XRY\_073\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Options: normal, abnormal, imageOnly, unobservable,

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**Caudal vertebrae morphology** UCDLA\_XRY\_074\_001 | v1.0

simpleParameter

**Req. Analysis:** false      **Req. Upload:** false      **Is Annotated:** true

**Options:** imageOnly, abnormal, normal, unobservable,

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