

CLINICAL SKILLS LAB – DEPARTMENT OF VETERINARY MEDICINE – UNIPG

1. WHAT IS A CLINICAL SKILLS LAB: The Importance of Preclinical Simulation

In the context of veterinary education, the establishment of a Clinical Skills Lab (CSL) represents a major step forward toward more ethical, safer, and more effective learning. These facilities, equipped with advanced simulators and realistic mannequins, offer students the opportunity to practice in a controlled environment, reducing risks to animals and enabling the gradual acquisition of clinical skills. This reduces student stress and ensures patient welfare.

The ethical and pedagogical principle of “**never for the first time on a live animal**” underpins this methodology, emphasizing the importance of preparing students for real clinical situations only after they have acquired a solid foundation of skills through simulation.

By using mannequins to practice diagnostic, surgical, and therapeutic techniques, students can repeat procedures multiple times, correct mistakes without consequences, and build confidence in their abilities. Simulation also fosters active and collaborative learning, stimulating clinical reasoning and problem-solving in complex and realistic scenarios. The simulation lab also allows for **objective assessment** of skills through standardized exercises and immediate feedback, promoting continuous performance improvement.

2. WHAT IS THE UNIPG EDUCATIONAL PROJECT?

2.1 What We Have Done:

The Department of Veterinary Medicine of Perugia has decided to establish a **Clinical Skills Lab (CSL)** to meet new educational needs and the growing emphasis on animal welfare, as also highlighted in the Standard Operating Procedures (SOPs) issued by the European System of Evaluation of Veterinary Training (ESEVT).

The Department’s interest in creating a CSL began with the thesis of Dr. Sei Ito, titled: *“Never the first time on a live animal”: Designing an Ethical Veterinary Clinical Skills Lab & Day One Competences Shaped by Student Feedback*” (supervisor: Prof. Silvana Diverio). The thesis included a student survey to identify areas perceived as priorities. A project was then developed based on these findings.

Two funding proposals were submitted to the **Fondazione Cassa di Risparmio di Perugia**, both of which were not accepted.

The first formal step by the Department was the creation of a **working group (WG)** dedicated to designing and implementing the CSL, composed of:

- Prof. Elvio Lepri (Coordinator), Associate Professor, Veterinary Pathology and Laboratory Diagnostics
- Dr. Giovanni Angeli, Technical Officer, Small Animal Surgery and Radiology
- Dr. Maria Cicogna, Contract Lecturer at OVUD, Livestock Medicine
- Dr. Maria Beatrice Conti, Researcher, Small Animal Internal Medicine
- Prof. Silvana Diverio, Associate Professor, Veterinary Physiology
- Prof. Francesca Mercati, Associate Professor, Veterinary Anatomy
- Dr. Giulia Moretti, Contract Lecturer, Small Animal Surgery

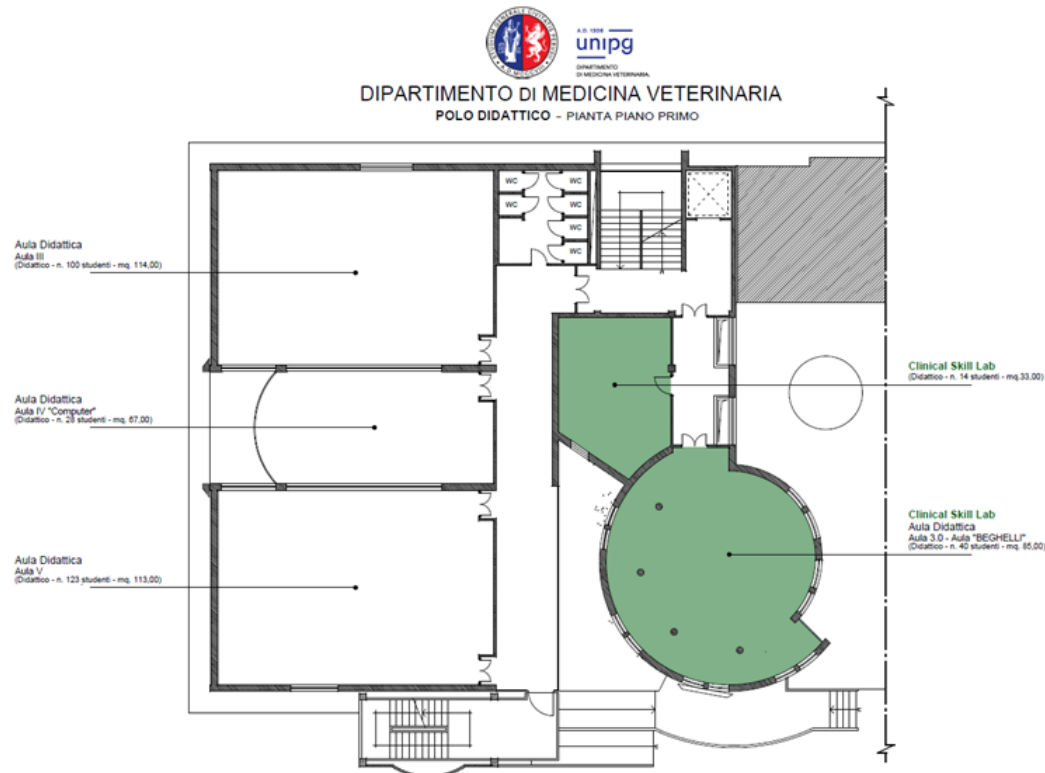
The WG initiated meetings with all subject area coordinators (SSD) to review pre-existing use of simulation tools before the CSL was established. A teaching project was then developed and summarized in a table attached to the Self-Evaluation Report 2025 (Appendix 6.1).

Appendix 6.1.

CSL equipment and disciplines

DISCIPLINES	"OTHER THAN LIVE ANIMALS" TOOLS USED IN PRACTICAL TRAINING	TOOLS AND PRACTICES IMPLEMENTED IN CSL
BASIC SCIENCES (Pre-Clinical Skills Lab)		
Anatomy of Domestic Animals	Anatomo table-vet Bones and skeletons Plastic dummies Biosphere 3D software	Photogrammetry 3D models
Physiology of domestic animals	Drama group (communication skills)	Cardboard cutout to familiarize with sounds, ECG and reflexes
Animal production sciences (Zootechnic)	Models of horse mouth	Models for BCS scoring; Safe approach to large animals
Microbiology and infectious diseases	Visit to microbiology lab	Mock of sampling and sending procedures (biosecurity) Examples of seeding plates with growth medium and pictures of colonies. Slides for bacterioscopy.
Epidemiology	Database use, bibliographic resources	
Parasitology and parasitic diseases	Visit to parasitology lab. Samples of macroscopic parasites. Sampling of cadaveric skin tissues (scrapings, imprint, scotch) for cutaneous parasites.	Slides for microscopic parasites; Images or samples of macroscopic parasites.
Pathology	Visit to pathology lab; smears from cadaveric samples; staining cytological smears.	Image database Slides and scans for microscopy (cytology). Simulation of sampling and sending procedures (biosecurity), including filling of a form.
CLINICAL SCIENCES (Clinical Skills Lab)		
Working station 1: HANDLING		
Ethology and Welfare		Dummies for low stress handling
Working station 2: INTERNAL MEDICINE		
Internal medicine (large animals)		Sampling for coxycgeal and aural venous sampling. Model with pathological sounds (respiratory, digestive, cardiac). Simulator of rectal palpation for training senses Model for application of ECG electrodes
Internal medicine (small animals)		Low-fidelity simulator for venous sampling. Recordings of heart sounds Simulator for canine cephalic and jugular venous sampling; Model for application of ECG electrodes. Model with pathological sounds (respiratory, cardiac)
Public health and legal medicine		Simulator of prescription of drugs (on-line simulation); Simulation of public health issue ("if you were ASL")
Clinical pathology and hematology	Visit to clinical lab; execution of smears from blood of VTH patients; interpretation of blood smears;	Simulation of blood smears; Slides for microscopy (haematology).
Working station 3: SURGERY		
Large and small animal surgery	Wet-lab based practice (sutures, surgical approaches, manoeuvres for reposition of luxation, fracture synthesis, bandages)	Suture pads. Otoscopy mannequin. Dummies for bandages. Bones for osteosynthesis (placing of plaques and screws) Dummies for pre-surgical preparation (scrubbing, etc)
Working station 4: EMERGENCY PROCEDURES		
Emergency medicine and critical care	Mannequin for tracheal intubation and thoracic massage.	Mannequin for complete CRR (tracheal intubation, thoracic massage, oro-nasal respiration, assisted ventilation, arterial pulse)
Working station 5: ANESTHESIOLOGY		
Anaesthesiology	Low-fidelity simulator for tracheal intubation, fixation of a venous catheter and ventilation	Intubation mannequin.
Working station 6: OBSTETRICS AND GYNECOLOGY		
Small animal gynaecology and obstetrics	High-fidelity mannequin (vaginocopy, vaginal smear, dystocia)	Simulator of canine ovariohysterectomy
Large animal gynaecology and obstetrics	Wet-lab based practice (genital system from the slaughterhouse to train for artificial insemination and uterine palpation; simulation of caesarean birth and uterus suturing).	Mannequin for bovine dystocia.
Large and small animal andrology		Simulator of canine and feline neutering.

Facilities identified for the CSL include the **Beghelli Room**—a large classroom also used for lectures and exams, allowing group activities with small simulators (e.g., suture or venipuncture simulators)—and an **adjacent room**, a smaller room exclusively dedicated to the CSL, where larger mannequins and simulators are used.



In parallel, a **preCLINICAL SKILLS LAB (pCSL)** has been established for practical training in basic disciplines (anatomy, pathology, microbiology, and parasitology), located in the library area. It incorporates the existing **Veterinary Anatomy Teaching Lab**, equipped with tools like the Anatomage virtual anatomy table, Biosphera software, and resin animal models.

Finally, a **Clinical Skills Farm (CSF)** is proposed at the **Teaching Farm (AZD)**, equipped with materials for first-year students to gain initial hands-on experience with livestock during activities such as the “Green Week.”

2.2 What We Are Doing and Planning to Do:

Based on discussions with course coordinators for each year, a list of skills to be acquired throughout the degree program has been compiled. Additional input came from the upcoming **practical assessment syllabus**, particularly regarding:

- 1.4 Activities aimed at acquiring "Animal handling" skills, to be performed on models
Conscious and correct selection and use of Personal Protective Equipment (PPE).
- 1.16 Insertion and reading of a microchip on an animal model.
Use of registration software for entering anamnesis and clinical records.
- 1.17 Acquisition of correct methods to safely approach the main domestic animal species of veterinary interest.
Acquisition of correct methods to restrain a patient, including safe application of a muzzle, leash, or halter.
- 1.18 Performing a general clinical examination and focused examination of individual organs and systems.
- 1.19 Correct handling of medications, understanding their preparation, dosage, and administration.
Performing subcutaneous, intramuscular, and intravenous injections on a simulator.
Preparation of an infusion line.
Simulation of the electronic drug prescription process and reporting of adverse reactions using simulator software.
- 1.20 Placement of a venous catheter on a model.
Placement of a nasogastric or nasal tube on an animal model.
Application of bandages to limbs and other parts of the body on an animal model.
Cleaning, disinfection, and suturing of skin wounds on an animal model.
- 1.21 Evaluation of Body Condition Score (BCS) in various animal species using a simulator.
Reading and understanding of animal feed labels.
- 1.22 Filling of a laboratory test request form.
Selection of the appropriate tube/container for each type of test.
Preparation of a sample for laboratory submission following biosafety and chemical safety standards.
Execution and interpretation of a skin scraping for ectoparasites on a simulator.
Cytological sampling using various techniques (FNA, imprint, scraping, centesis) and preparation of a smear from the collected material.
Execution of a sample collection for histological analysis.
Interpretation of the main cytological, hematological, vaginal cytology, and microbiological patterns.
- 1.24 Positioning of the body for radiological investigations.
Positioning with identification of acoustic windows for ultrasound examinations.
Placement of electrodes on a mannequin to perform an ECG.
- 1.30 Gowning for access to the surgical suite.
Hand washing in different contexts (outpatient, surgical).
Surgical preparation of the area (scrubbing, draping, etc.).
Performing simple and complex sutures.

- Performing routine surgical procedures (canine orchiectomy and ovariohysterectomy).
- 1.31 Execution of anaesthetic blocks in part models (horse limb, dog head).
Placement of an endotracheal tube in a dog and other species.
- 1.34 Identification of major gross pathological lesions.
Identification and understanding of the main histological patterns of lesions.

CSL stations are divided into six main areas:

1. Animal Handling
2. Internal Medicine
3. Surgery and Radiology
4. Emergency Medicine
5. Anesthesiology
6. Obstetrics and Gynecology

2.3 What Equipment is Used *

The Clinical Skills Lab is equipped with the following tools to be used for the following purposes.

MATERIAL	N.	PROCEDURE	COMP.	LOCATION
Soft and rigid plush toys, muzzles, harnesses	20	Safe animal restraint, handling and transport for both the animal and the operator	1.4 / 1.17	CSL
Memory game based on clothing and personal protective equipment	1	Selection of PPE according to the context of use	1.4	pCSL
Rigid mannequin in standing position	2	Microchip insertion and reading	1.16	CSL
PC with access to SIOVUD **	2	Use of registration software for entry of clinical and anamnesis record	1.16	CSL / pCSL
Cardboard cutouts of cow and horse with marked approach areas on the ground	2	Acquiring correct methods to safely approach main domestic veterinary species	1.17	CSF
Silicone model of canine head with ear canals	1	Otoscope exam, ear cleaning and administration of ear medications	1.18	CSL
Cardboard cutouts of cow, horse and dog with QR code	3	Familiarization with physiological and pathological sounds	1.18	CSL
Low-fidelity rectal palpation simulator	1	Developing tactile sensitivity through inert layer (plastic sleeve) by recognizing objects of different shape and size	1.18	CSF

MATERIAL	N.	PROCEDURE	COMP.	LOCATION
Empty drug packages, syringes, saline solution for dilution	1	Proper drug handling, understanding preparation, dosage and administration	1.19	CSL
Infusion pump	1	Preparation of an infusion line	1.19	CSL
PC with access to simulation software	1	Simulation of electronic drug prescription and adverse reaction reporting via simulator	1.19	CSL
Silicone pads	20	Performing intravenous injections on simulator	1.19	CSL
Bovine auricular vein simulator	20	Performing intravenous injections on simulator	1.19	CSL
Canine cephalic vein simulator	1	Performing intravenous injections on simulator	1.19	CSL
Canine jugular vein simulator	1	Performing intravenous injections on simulator	1.19	CSL
Bovine coccygeal vein simulator	1	Performing intravenous injections on simulator	1.19	CSL
Rigid and soft mannequins; silicone pads	2	Performing subcutaneous and intramuscular injections	1.19	CSL
Silicone pads	1	Application of a venous catheter on model	1.20	CSL
Dog and cat models	2	Placement of nasogastric or nasal tube for assisted respiration on animal model	1.20	CSL
Soft mannequins, mannequins with rigid internal support, silicone simulators	5	Bandaging limbs and body parts on animal model. Cleaning, disinfecting, and suturing skin wounds on animal model	1.20	CSL
CPR resuscitation mannequin	1	Perform basic CPR operations (ventilation, massage, pulse check)	1.20	CSL
Sheep BCS simulator, BCS visual materials for dog/cat	1	BCS evaluation in various species on simulator	1.21	CSF, CSL
Feed label folder	1	Reading and understanding animal feed labels	1.21	CSF
Folder with lab test request forms	1	Fill out lab test request forms	1.22	pCSL
Microscope with slide set; scanned slides	1	Interpretation of main cytological, hematological and microbiological patterns	1.22	pCSL
Microscope with slide set; puzzle-game	1	Interpretation of main vaginal cytology patterns	1.22	pCSL
Clay simulators of lesions to be sampled, silicone pads	10	Biopsy collection for histological analysis	1.22	pCSL

MATERIAL	N.	PROCEDURE	COMP.	LOCATION
Simulators with animal skin-like material	1	Perform and interpret skin scraping for ectoparasites on simulator	1.22	pCSL
Containers, test tubes and various packaging	10	Sample preparation for lab shipment following biosafety and chemical safety norms; selection of proper test tube/container per exam	1.22	pCSL
Silicone pads – slides	10	Cytology sampling using various techniques (FNA, imprint, scraping, centesis) and smear preparation	1.22	pCSL
Mannequins / radiology dummy table	1	Body positioning for radiological investigations	1.24	CSL
Mannequins / ultrasound dummy machine	1	Positioning with identification of acoustic windows for ultrasound exams	1.24	CSL
Mannequins / ECG dummy machine	1	Electrode positioning on mannequin for ECG	1.24	CSL
Hand washing tools / surgical clothing and gloves	10	Surgical room dressing; hand washing in outpatient and surgical contexts	1.30	CSL
Canine ovariohysterectomy simulator	2	Performing routine surgical procedures (canine ovariohysterectomy)	1.30	CSL
Canine orchiectomy simulator	2	Performing routine surgical procedures (canine orchiectomy)	1.30	CSL
Silicone pads	20	Performing simple and complex sutures	1.30	CSL
Soft mannequins with waterproof parts	2	Surgical site preparation (scrub, draping, etc.)	1.30	CSL
Various bone segments	10	Simulating repair of simple and complex fractures with screws and plates	1.30	CSL
Bone segment models	2	Performing anesthetic blocks on limb (horse) and head (dog) models	1.31	CSL
Canine head mannequin	1	Endotracheal tube placement in dog	1.31	CSL
PC with access to Network Attach Storage (NAS) archive	1	Identify main gross pathological lesions	1.34	pCSL
Microscope with slide set; scanned slides	1	Identify and understand main histological lesion patterns	1.34	pCSL
Cardboard cutouts with QR code	2	Simulation of interactive clinical cases	NA	CSL

MATERIAL	N.	PROCEDURE	COMP.	LOCATION
Bovine dystocia mannequin	1	Diagnosis and treatment of bovine dystocia	NA	CSL
Canine gynecological mannequin	1	Vaginal endoscopy, artificial insemination, diagnosis and resolution of dystocia in female dog	NA	CSL
Anatomage table vet	1	Reinforcement of topographic anatomy and comparison with different imaging methods	NA	pCSL
PC with BIOSPHERA software	1	Reinforcement of topographic anatomy	NA	pCSL
Plastic mannequins	6	Reinforcement of topographic anatomy	NA	pCSL
Filing cabinet with selected bone segments	1	Reinforcement of osteology	NA	pCSL

COMP: competence fulfilled according to Syllabus

* EQUIPMENT PLANNED, current equipment as of 21-10-2025 in bold

** the use of SIOVUD database is strictly under control of staff personnel that use his/her own credentials

3. RULES FOR USING THE CSL

Access to the CSL is currently limited to **curricular practical activities and Practical Training** under the guidance of the professor. Booking is required through a specific form on the Department website [📄](#). During sessions, instructors must sign a paper log indicating their presence, number of students, and tools used. Upon leaving, the CSL must be left clean and organized. Any feedback or issues can be reported through the booking form.

Spontaneous attendance by students, currently unavailable, will be possible one afternoon per week, subject to classroom availability and capacity. Students must book using the same booking form [📄](#) and will receive a confirmation email with the CSL opening hours. Access outside of these hours may be requested, but will depend on the availability of a designated instructor, who will act as a tutor for students in the CSL and assume responsibility for its proper use during this time.

To facilitate independent practice, **each CSL activity is accompanied by a technical guide** (accessible via QR code), with preparation, execution, and evaluation instructions. Some also include video tutorials.

Access to the pCSL is available during teaching facility hours, with booking via the Department website. Use of digital and physical anatomy learning tools is governed by a specific procedure published on the site. Microscope slide sets are available at the front desk upon signature and must be returned in good condition. Any breakages or losses must be reported via the form (note section).

The **Clinical Skills Farm is used by students participating in Green Week** or mobile clinic activities at the Teaching Farm (AZD), under the supervision of the course instructor.