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Technology in Veterinary Medicine

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Technologies used in human medicine are also used in the veterinary medicine for therapeutic purposes and diagnostic to better understand the health of animals. The last trends in veterinary technology have moved towards the integration of devices to monitor pets and interact with veterinarians. From inspection to treatment, these tools, devices and technologies allow vets to provide correct and effective medical care to pet-patients.

A general tool list for a veterinary clinic includes: thermometers; stethoscopes; laryngoscopes; a centrifuge; an autoclave; glucometers; anesthesia machines; IV pumps; cages and crates.

An electronic thermometer is most commonly used in veterinary practice for both large and small animals. Typically temperatures are taken rectally. Stethoscopes are standard tools that, thanks to their specially designed acoustic cups, enable vets to bypass fur, animal muscles, and actually hear the heart and lung sounds of any animal. Laryngoscopes are typically used in veterinary practices during the process of intubation prior to surgery. A centrifuge is commonly used in veterinary practices in order to prepare blood samples for analysis. Components of the blood are separated using high velocities and centrifugal force. Vets must ensure proper sterilization of their medical tools. Autoclave steam sterilization helps ensure that vet tools are satisfactorily disinfected and sterilized, for optimal pet-patient outcomes. Autoclaves come in various

sizes. The most expensive autoclave is an automatic or digital autoclave, which enables faster turn-around than its manual version. A glucometer is a tool used to approximate blood glucose levels, often in order to manage type 1 and type 2 diabetes mellitus. Anesthesia machines are used to make pets stay still during scans, invasive exams and procedures, from the pain of their injuries, surgeries or other treatment protocols. Anesthetic equipment at a veterinary practice ensure animals receive adequate oxygen, ventilation and breathing while under anesthesia and mix the anesthetics properly according to predetermined concentrations, through a mostly automated process that minimizes risk to the patient. Almost all veterinary clinics use IV pumps to administer fluids, drugs and other supplements during surgeries and other treatments. IV pumps are the preferred method for controlling the delivery of a constant rate infusion (CRI) of the substance to be provided to the patient, for a consistent or time-dependent effect [1].

Common diagnostic technologies include: x-ray; ultrasound; ecg; bp monitor; biochemistry analyzer; pulse oximeter; refractometer; veterinary laser; microscopes; incubators; defibrillators; CT scanners; veterinary monitors.

Digital radiology (X-Ray) technology enables veterinarians to quickly and accurately obtain clear images of animals muscles, bones, internal organs, without requiring the use of film, chemicals or darkroom processing. The images obtained can be saved to a digital database. The most advantages of this are that animals can spend less time under anesthesia and on the examining table and more time at home for resting and recovering from their particular condition. Vets need diagnostic equipment, such as veterinary ultrasounds, which use sound waves to scan and present internal images of an animal's body, around at all times. New, innovative, real-time ultrasound equipment with external cameras significantly reduces exam time while producing deeper and wider crisp

images of vascular, abdominal, vascular, musculoskeletal and other systems. If they need, these images can be shared live via telemedicine with a sonographer, for richer real-time guidance, with far less diagnostic guesswork involved. Refractometers. used for measuring the refractive indices of gases can be of four main types: traditional handheld refractometers, digital handheld refractometers, laboratory or Abbe refractometers and inline process refractometers. There are also the Rayleigh Refractometer CT scanners which are needed for accurate imaging and diagnosis. Defibrillation is a treatment for life-threatening cardiac dysrhythmias, specifically ventricular fibrillation and non-perfusing ventricular tachycardia incubators. Laser therapy is a treatment modality that has been utilized for decades, but is finally finding its place in mainstream veterinary medicine. Therapeutic laser has been incorporated into treatments that address diverse conditions including: skin wounds; tendon and ligament injuries; trigger points; edema; lick granulomas; muscle injuries; nervous system injury and neurologic conditions; osteoarthritis; post-operative incisions and tissues; pain [2].

In addition, there is more specific equipment which is often used in veterinary medicine, for example Hartmann alligator forceps, Elizabethan collar, orthotics devices. The Hartmann alligator forceps (Hartmann foreign body forceps) are medical forceps for removing foreign bodies. You can even grasp objects in small tubes and position them precisely. In veterinary medicine the Hartmann, ear polypus forceps are used to remove awns or epilate hairs of dog's ears. The design reduces the natural tremor. An Elizabethan collar (E-Collar, Buster colla) is a protective medical device worn by an animal, usually a cat or dog. Shaped like a truncated cone, its purpose is to prevent the animal from biting or licking at its body or scratching at its head or neck while wounds or injuries heal [3].

Orthotics is an allied health care field concerned with the design, development, fitting and manufacture of orthoses which are devices that support or correct musculoskeletal deformities and/or abnormalities of the body. Animals that might benefit from the use of an orthosis commonly have an injury to a lower limb or paw, such as a fracture, torn meniscus, ruptured Achilles tendon, or injured cruciate ligament. They may also have an orthopedic condition due to arthritis, spinal cord injury, or a congenital abnormality. Orthoses can decrease pain and increase stability in an unstable joint, as well as prevent potential progression or development of a deformity or contracture [2].

References:

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