Dinbeat UNO

Congestive heart failure emergency protocol

Emergency protocol
Congestive heart failure emergency

1.Assess the patient's condition

·Physical examination + assessment of vital signs Þ assess degree of compromise and instability of the patient.

2. If the patient is stable enough:

- Chest X-rays and/or fast echocardiography.
- DINBEAT UNO application Þ START MONITORING
- If not stable: Oxygen therapy and stabilization (oxygen chamber, hood, ...)

3. IV catheter application if possible, otherwise wait.

4.Start medical treatment:

Furosemide:

- Initially:
  - Bolus of 2-4 mg/Kg IV or SC if no IV catheter.
- Continue:
  - Bolus: 1mg/Kg every 1-2 hours
  - Infusion: 1mg/Kg/hour (maximum 1.5mg/Kg/hour)

·Fluid therapy. Assess need. Hypotonic serum: RL at low speed: 1mL/Kg/hour? Alternative: offer water at patient disposal.

·Fluid supplementation with potassium chloride to prevent hypokalemia. As it is generally not possible to draw blood to assess serum levels, a good option is the supplementation with 20mEq KCl in 1 Liter RL).

Oxygen therapy maintenance

·Control heart rate, respiratory rate, temperature and ECG with DINBEAT UNO.

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5. Is it stable enough to assess the systolic function with fast echocardiography? (if so, we do a monitoring pause removing the harness, but leaving the patches).

Assess the need for:

- Pimobendan IV: 0.15mg/Kg IV
- CRI Dobutamine: 5µg/Kg/min.
- Vasodilator: topical nitroprusside, handling care!

6. Continue therapy until complete stabilization of the patient.

Monitoring		
Parameter	**Traditional monitoring**	**Monitoring with Dinbeat UNO**
Heart rate	every 4 hours	CONSTANT
Breath rate	every 4 hours	CONSTANT
Temperature	every 8 hours	CONSTANT
ECG	every 8 hours	CONSTANT
Blood pressure	every 8 hours	EVERY 8 HOURS

7. Also carry out tests to reconsider the dose and frequency of the medication:

·Chest X-ray: every 12 hours.

·Control of renal values and ions: every 24 hours.

When can we use Dinbeat UNO?

At the hospital, DINBEAT UNO will allow easier, constant and complete monitoring, avoiding counterproductive stress, facilitating the work of staff and favoring the detection of possible complications that could go unnoticed. All this with records that will be recorded, to be reviewed, consulted or compared later.

As complications we could possible find:

- Tear or rupture of the Left Atrium: very serious complication that can lead to the death of the animal. If the animal survives, it is usually accompanied by severe arrhythmias and pericardial effusion.
- Pulmonary hypertension, in which echocardiography shows increased regurgitation velocity in the pulmonary and/or tricuspid valves. Start with Pimobendan (if not prescribed previously) or Sildenafil.
- Patients refractory to Furosemide, in which there is not the expected clinical improvement. The change of diuretic or the addition of one or more complementary ones is usually assessed.

Once the patient is stabilized and given a favorable evolution, the patient can be discharged.

Therapy is generally continued by switching all medications to oral administration. In the case of Furosemide, subcutaneous therapy can be maintained, teaching the tutors the correct application of the medication by this route. These are cases in which the animal presents a lack of complete remission of the pulmonary edema and the subcutaneous route is used because it presents better absorption than in the case of the oral route.

When can we use Dinbeat UNO?

Then, subsequent controls at the veterinary center: physical examination, X-rays and analyzes for the assessment of renal function and/or electrolytes.

Likewise, those responsible for these animals are usually recommended to count breaths per minute at rest or asleep, teaching how to count them and recommending a physical record or with the help of mobile applications. Since it is considered an especially transcendent and useful parameter in the detection of patients in initial phases or prior to decompensation and reentry into congestive heart failure.

At the outpatient level, Dinbeat UNO can be a great monitoring tool, especially in patients in the initial phases of post-decompensation or for those patients in the process of decompensation.

All this, with data in real time and being possible to consult data remotely and simultaneously by veterinarians and owners.

And, in addition, with the possibility of consultation and advice from experts for those more complicated cases.

References

Bednarski, R., Grimm, K., Harvey, R., Lukasik, V. M., Penn, W. S., Sargent, B.; Spelts, K. (2011). AAHA anesthesia guidelines for dogs and cats. Journal of the American Animal Hospital Association, 377–385. https://doi.org/10.5326/JAAHA-MS-5846.

Billeci, L., Marino, D., Insana, L., Vatti, G., & Varanini, M. (2018). Patient-specific seizure prediction based on heart rate variability and recurrence quantification analysis. PLoS ONE, 13(9). https://doi.org/10.1371/journal.pone.0204339.

Crowe, D. T. (2006). Assessment and Management of the Severely Polytraumatized Small.

Hellyer, P., Rodan, I., Brunt, J., Downing, R., Hagedorn, J. E., Robertson, S. A., & AAHA/AAFP Pain Management Guidelines Task Force Members. (2007). AAHA/AAFP pain management guidelines for dogs and cats. Journal of Feline Medicine & Surgery, 9(6), 466-480.
nica veterinaria Vetermedicas (Doctoral dissertation, Universidad Cooperativa de Colombia, Facultad de Ciencias de la Salud, Medicina Veterinaría y Zootecnia, Bucaramanga).

Ramírez, E. Y., & Alonso, J. A. M. (2005). Manual clínico de cardiología básica en el perro y el gato (Vol. 286). Servet.

Smith, F. W., Patrick Tilley, L., & Miller, M. S. (n.d.). GENERAL PRINCIPLES OF ELECTROCARDIOGRAPHY Indications for Performing Electrocardiography. https://doi.org/10.1016/B0-7216-0422-6/50146-7.

Tilley LP, Smith Jr FWK. Electrocardiography. En: Tilley LP, Smith Jr FWK, Oyama M, Sleeper MM: Manual of canine and feline cardiology. Fifth edition. Saunders Elsevier. Missouri USA, 2008; pp 49-76.

Torrente, C., & Bosch, L. (2011). Medicina de urgencia en pequeños animales. Tomo I. Zaragoza: Servet editorial - Grupo Asís Biomedia S.L.

Yagi, K., & Holowaychuk, M. (Eds.). (2016). Manual of veterinary transfusion medicine and blood banking. John Wiley & Sons.