

Metronomic chemotherapy

Metronomic chemotherapy involves giving low doses of medications on a frequent basis. “Metronomics” was termed after the metronome that sits atop a piano. Like the metronome, the administration of medications is unvaryingly regular in its rhythm.

The basis for this type of treatment is three-fold:

- it enables continuous drug exposure to susceptible cancer cells and the tumour environment
- it can inhibit tumour blood vessel growth, this means it’s “anti-angiogenic”.
- it can alter the balance of the patient’s immune system. In the body there are many types of T lymphocytes (a type of white blood cell), some of them are “good” in that they work to fight the cancer, such as *cytotoxic* and *helper T-cells*. Others can be ‘bad’ because they minimise the bodies desire to fight the cancer cells, these are called *regulatory T-cells*. Metronomic chemotherapy can target and reduce the level of regulatory T-cells, thus helping the immune systems to respond appropriately to the cancer.

This is a relatively new type of treatment for pets with a relatively small number of published studies, however anecdotal use has been done for some time. Metronomic therapy has been used in people more frequently, in particular for treating breast cancer in women. For pets, this therapy can be a good option for some soft tissue tumours when other more commonly used treatment options are not available or not appropriate. It can also be considered as a rescue option, when other treatments have failed. Finally, it is often used in the metastatic setting, to slow tumour growth.

Ideally the metronomic ‘cocktail’ includes multiple drugs, all given by mouth (oral tablets). The drugs we use will depend on your pet, their response and the cost of the drug(s). Typically, the cocktail uses an anti-inflammatory drug (i.e. piroxicam), an alkylating agent (chemotherapy drug) and an anti-angiogenic drug. For the latter we can use doxycycline and/or a small molecule inhibitor (Palladia or toceranib). The benefits of metronomic therapy are that it is easy to administer, sometimes lower cost than conventional chemotherapy and it is associated with minimal side effects.

It can be difficult to assess the success of metronomic therapy, in particular it’s anti-angiogenic effects. This is because the changes that are occurring are microscopic and not measurable externally. Often veterinary oncologists will deem the treatment successful if the patient remains in ‘stable disease’. This means that the cancer doesn’t grow any further whilst your pet is being treated. Finally, generally speaking, this treatment option works best with the lowest possible tumour burden.