

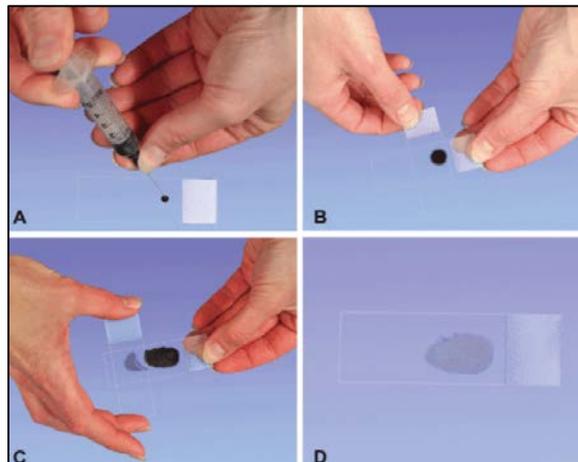
**Lymph node fine needle aspiration (FNA)** is generally a useful technique for the diagnosis of infectious disease, reactive lymphadenopathy, or neoplasia. However, lymph node aspirates are frequently poor to non-diagnostic. While fragility of cells either from inflammatory or neoplastic processes can affect quality, flawed technique (in sampling or slide preparation) is also a substantial contributing factor. The following guidelines have been developed to assist the judicious clinician in proper technique, slide preparation, and sample shipping.

**Sample collection:**

1. If there is generalized lymph node enlargement (lymphadenopathy), a minimum of 2 nodes should be sampled
2. Avoid sampling the center of the node
3. Clip and scrub the surface of the skin prior to sampling
4. Immobilize the tissue between the thumb and forefinger
5. Insert the needle (22 gauge works best for medium-sized dogs and cats) and advance into (not through) the node
6. Redirect the needle several times by moving in and out in different directions
7. Keep looking into the hub of the needle, once a small bleb (about 1-2 drops) of sample is present, pull out and prepare slides

**Slide preparation:**

1. Attach a syringe filled with air to the needle
2. Eject a small amount (about ½ drop) of sample onto several clean slides (see figure A) near the frosted edge
3. Gently lay a clean slide on top of and perpendicular to the sample slide (see figure B)
4. Gently pull the top slide across the sample slide until an oval shaped smear is made without applying any downward pressure to avoid rupturing cells (see figures C and D)
5. The resultant sample should not be too thick, but should have a smooth even appearance (see figure D)



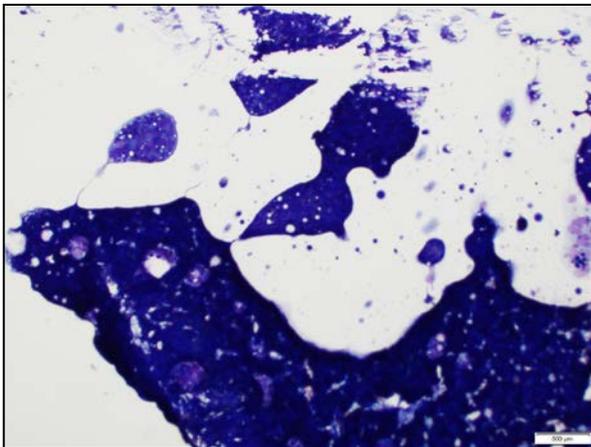
**Sample shipping:**

1. Label all slides with patient name and lymph node location (at a minimum)
2. Package slides carefully either in a slide box or palette
3. Ensure there is no movement of slides during transit (pack with newspaper or paper towels)
4. Do not send cytologic specimens in the same box with formalin
5. Do not heat fix anything (use a blow dryer if need to rapidly dry for some reason) and do not refrigerate slides (can lyse cells)

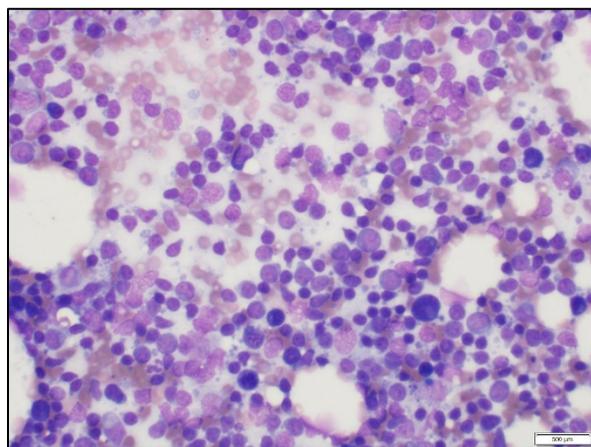
**Tips and tricks:**

- Preferentially aspirate enlarged lymph nodes; popliteal and pre-scapular nodes are often the most accessible, but may not be enlarged
- If mandibular lymph nodes are not enlarged, please do not sample them (they are often reactive in patients with dental disease)
- **You can help!** We often receive slides (like the left image below) with lysed cells and a thick smear that make it difficult to interpret. Before you send us your samples, use Diff Quick to stain a slide for you to review before shipping; if there are not several areas with a monolayer of intact, high quality cells (right image below), consider re-aspiration

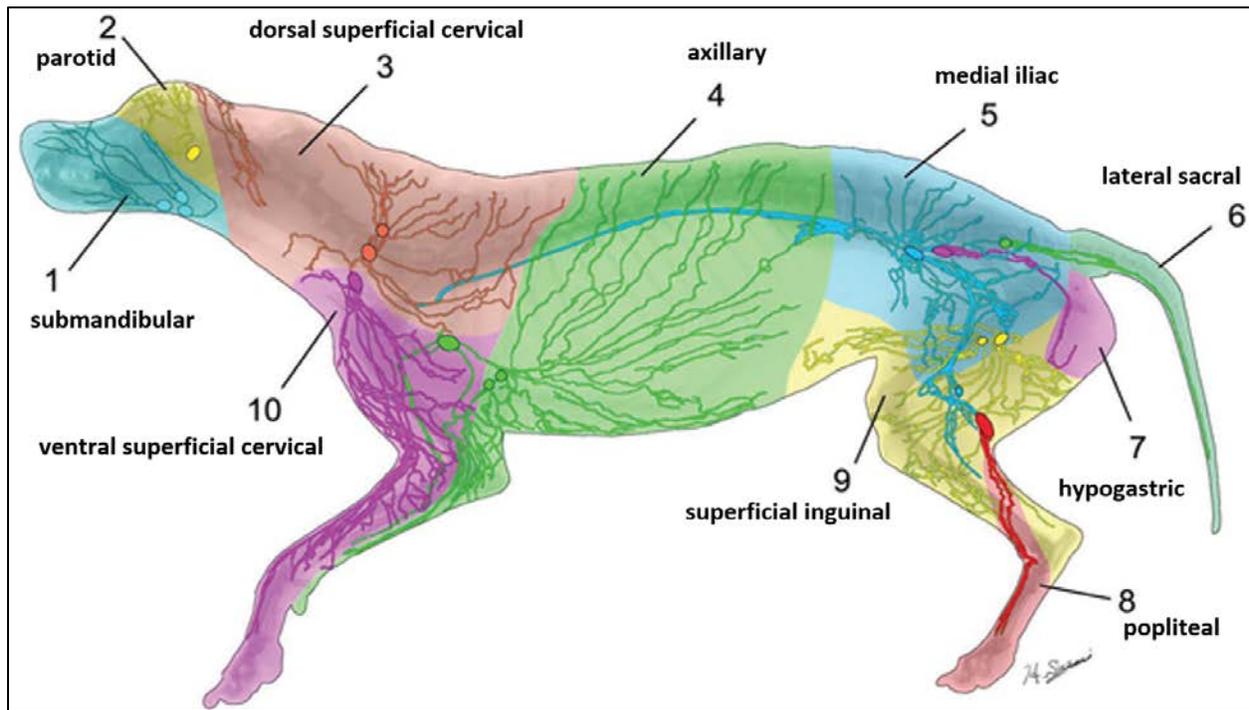
**This sample is too thick.**



**This sample is adequate.**



- If you are suspecting metastasis, please use the following image to help identify the appropriate draining lymph node to sample



<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0069222>

#### References:

Lymph node cytology: What should & should not be there. Today's Veterinary Practice website.

<https://todaysveterinarypractice.com/lymph-node-cytology-what-should-should-not-be-there/>

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Messick JB. The lymph nodes. In: Valenciano AC, Cowell RL, eds. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 4<sup>th</sup> ed. Elsevier: St. Louis, MO; 2014:180-194.

Suami H, Yamashita S, Soto-Miranda MA, Chang DW (2013) Lymphatic Territories (Lymphosomes) in a Canine: An Animal Model for Investigation of Postoperative Lymphatic Alterations. PLOS ONE 8(7): e69222. <https://doi.org/10.1371/journal.pone.0069222>.