MAYO CLINIC LABORATORIES

Assistance With Bone Marrow Collection

Division of Hematopathology
Hematopathology Morphology Laboratory

Purpose: To define technician responsibilities and interactions with collection nurse during collection and sample processing of bone marrow.

Procedure

Follow general instructions below to prepare for **bone marrow sample collection**.

Step	Action
1	Clearly identify patient and procedure.
2	Assemble collection materials and tubes. Use syringes **not** rinsed with heparin for slide preparation and clot. The standard bone marrow collection consists of: • Empty tube with cap: ½ mL for clot (drawn in blank syringe with no heparin in it) • One lavender top (EDTA) tube: 3 mL for possible molecular testing • One yellow top (ACD solution B) tube: 4 mL for possible flow cytometric testing • One green top (sodium heparin) tube: 3 mL for possible chromosome analysis and/or FISH testing • Two formalin containers Place 7 clean slides on the work surface for collection. Have other slides available for use if needed. • 2 slides (peripheral blood smear) • 5 slides (bone marrow aspirate) • 3 slides (biopsy touch preps)
3	Label slides, tubes, and containers.

Peripheral blood smears preferred by **fingerstick** made for review with bone marrow. Follow instructions below to collect this sample.

Step	Action
1	Perform fingerstick.
2	Make 2 direct smears manually, adjusting as necessary for proper length and thickness.

Follow steps below to obtain **bone marrow core biopsy, clot and aspirate specimens**.

Step	Action
1	Syringes used for bone marrow slides and clot should **not** be rinsed with heparin. All other syringes can be pre-rinsed with liquid heparin to prevent clotting.
2	Expel some of the aspirate onto a slide to check for units. • If adequate units are present, continue. • If the sample is inadequate, request **redirect of needle** for better unit sample. **Note:** Due to drug therapy or patient disease, some samples may **not** have good units.
3	**Make slides from the aspirate collected** • Make slides immediately once aspirate is obtained. • Decant excess fluid from slide or tip the slide so the excess fluid drains away from the units. • **Direct smears:** Use a glass rod to place a drop of aspirate toward the frosted end of the slide and make a wedge smear with a clean slide. Make 2 good direct smears. • **Unit preps:** Use a glass rod to place a drop on slide, slightly above the center, and use a clean slide to **gently** "squash" the units to spread them out. (Forceful "squashing" will break the cells.) Pull the 2 slides in opposite directions horizontally until the smear is complete. ◦ Pull at a steady speed, but not too fast, to prevent cell distortion. ◦ Make 3 good unit preps per unilateral collection. • Make your best effort to prepare evenly distributed slides without crush artifact, of correct length and thickness. • **Touch preps:** Prepare 3 touch prep slides from biopsy.

4	Fill sample tubes quickly after making the slides. 1. Use sample in non-heparinized syringe. 2. Put ½ mL in empty tube. 3. After clotted, move clot to formalin vial. 4. Priority of filling sample tubes is: a. **Lavender top (EDTA):** 3 mL b. **Yellow top (ACD):** 4 mL c. **Green top (sodium heparin):** 3 mL 5. Recap and gently invert to mix.
5	Check the biopsy core for adequacy as soon as collected (1 cm length **minimum**). • Assess whether biopsy piece appears to be bone, cartilage (inadequate) or fat (inadequate). ◦ Bone has a spongy, porous texture. ◦ Cartilage has a hard, white appearance and texture. Sometimes tumors will appear to be white or black, but will not usually have the hard texture of cartilage. ◦ Fat has a yellow appearance and soft feel. • If inadequate, ask for a redirect for better core biopsy sample. ◦ Even if some of the core appears inadequate, **keep all pieces for processing**. **Touch prep instructions** • Use forceps to move biopsy core to a clean slide and gently roll core across the full length of the slide. ◦ Do **not** crush the biopsy. ◦ Make 3 touch preps. • Gently remove clot, if necessary. • Place all collected biopsy pieces into the formalin vial separate from the clot.

Transport

Step	Action
1	**To transport specimen** • Place slides in plastic slide holder and stretch parafilm around container. • Core and clot should be in separate formalin jars, with parafilm stretched around lids. To avoid formalin contamination, slide carriers must not have been previously used to carry fixed slides. Place slide carriers in a separate bag and apart from any formalin-fixed biopsy specimens during transport.