

HOW TO PERFORM A BONE MARROW BIOPSY

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DISCLOSURES

- Jeremy Heinerich, PA-C
 - no disclosures

OBJECTIVES

- Discuss indications for bone marrow biopsy
- Discuss contraindications for bone marrow biopsy
- Evaluate set up and technique
- Practice hands on with models

BONE MARROW BIOPSY VIDEO

THE NEW ENGLAND JOURNAL OF MEDICINE



<https://www.youtube.com/watch?v=N-Evp9oYljE>

<http://www.nejm.org/doi/full/10.1056/NEJMvcm0804634>

Another Bone Marrow Biopsy video

<https://www.youtube.com/watch?v=3hzVvCl8UkM>

Anatomy for Bone marrow biopsy site

<https://www.youtube.com/watch?v=cUXXWWYj3zo>



INDICATIONS FOR BONE MARROW BIOPSY

ALWAYS KNOW THE WHY BEHIND THE PROCEDURE

- To assess the cause of a hematologic or oncologic disorder
 - Primary bone marrow disorder (leukemia, MDS)
 - Staging of a disease (lymphoma)
 - Investigate pancytopenia
 - Assess for metastatic spread of other tumors (prostate, breast)
 - Determine remission and response to therapy

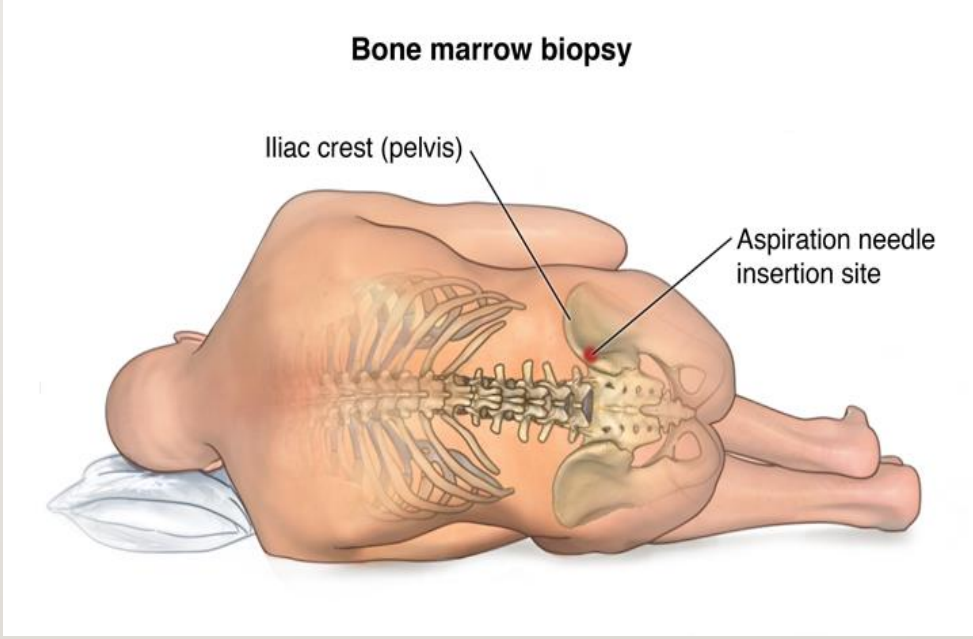
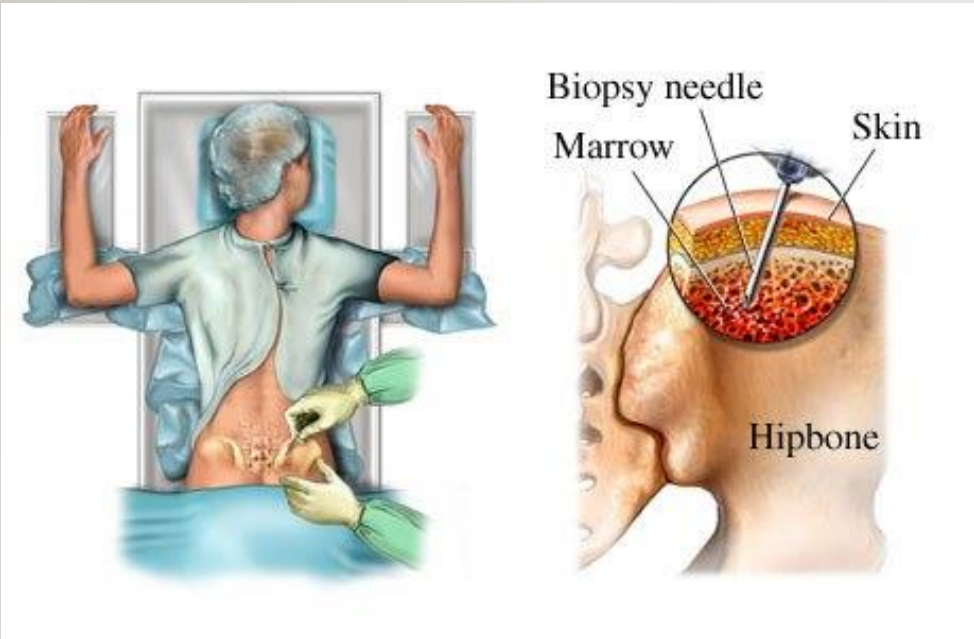
PREPARING YOUR PATIENT

- Informed consent
- Explain the procedure: We will review the steps
- Prepare your equipment
- Discuss with colleagues WHAT tests you want to send
- Are there any contraindications to the procedure or allergies?
 - Allergies to betadine/latex/lidocaine
 - Active infection in the area
 - Significant bleeding risk (APL patients)

WHAT DO YOU NEED?

- Sterile Drape and Gloves
- Betadine
- Lidocaine (1% or 2%) (some institutions use Sodium Bicarbonate to lessen the burning sensation)
- Heparin for aspirate samples (**institution dependent**)
- Assorted needles for lidocaine injection
- Bone marrow Aspirate and Biopsy needles
- Gauze
- Assorted syringes to take aspirate samples
- Fixative solution for bone marrow biopsy and clot
- Tubes (Typically green and purple) to send aspirate sample for testing

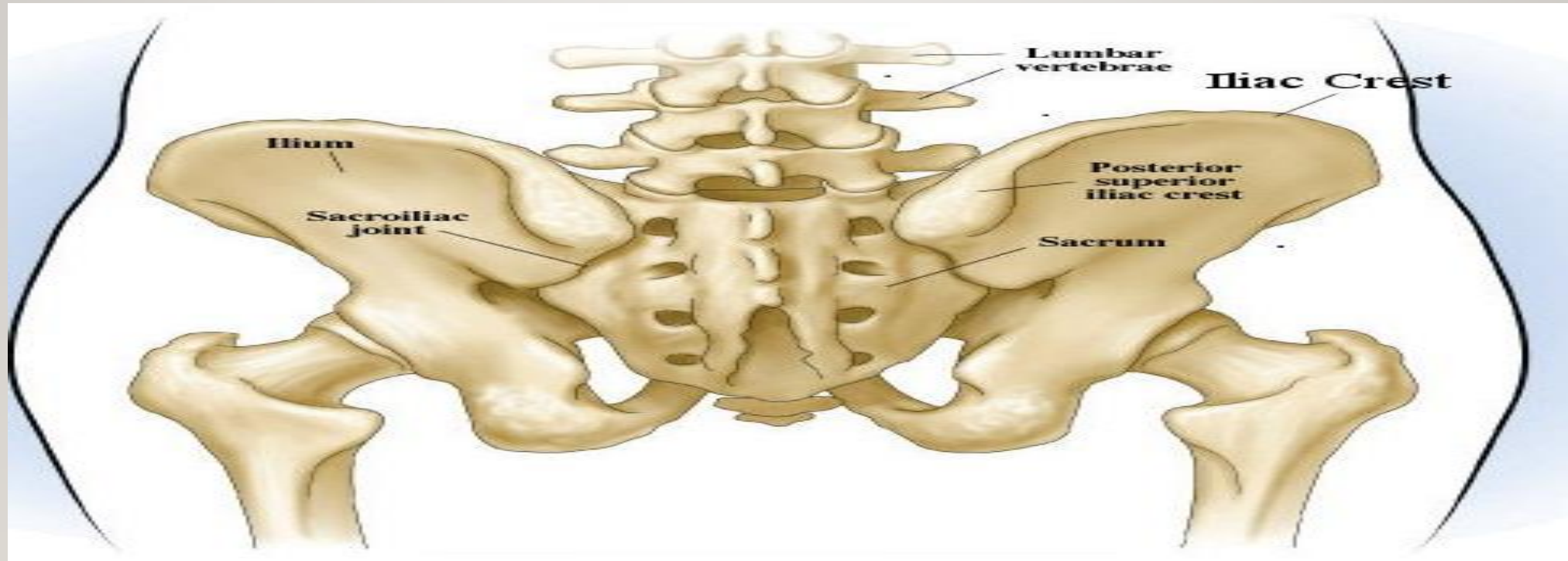
POSITIONING YOUR PATIENT



ASSUMING THE POSITION



LOOKING UNDERNEATH THE SKIN



Iliac Crest Pain

<http://www.newhealthguide.org/Iliac-Crest-Pain.html>

ANESTHETIZE THE AREA: FORM A WHEEL TO THE PERIOSTEUM




YOUR WEAPON OF CHOICE

THE TROCHAR



YOUR WEAPON OF CHOICE

THE TROCHAR



T-Lok™ Bone Marrow Biopsy Needle

Better specimen quality, low risk of specimen loss

Biopsy Needle
Ergonomically designed "Twist-Lock" handle allows for sufficient pressure, while keeping assembly intact.

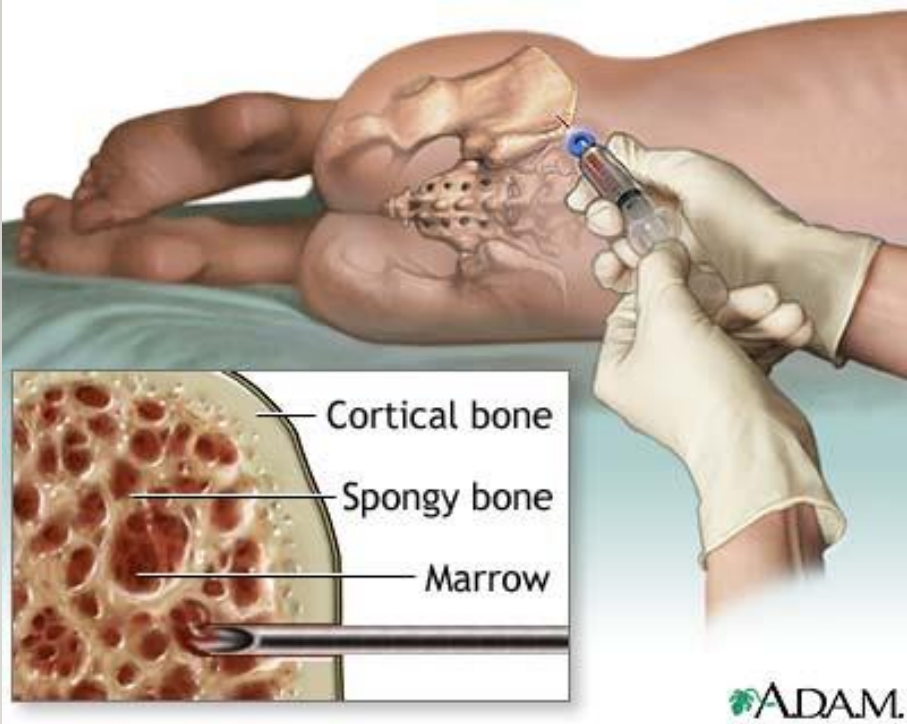
T-Lok™ Extraction Cannula
"Twin Peaks" cutting edge on the tapered distal cannula tip provides superior biopsy coring ability.

Marked Obturator/Probe
When inserted into needle cannula, inscribed mark indicates length of specimen prior to extraction.
Unique "double-diamond" stylet point for quick and easy penetration into marrow cavity.

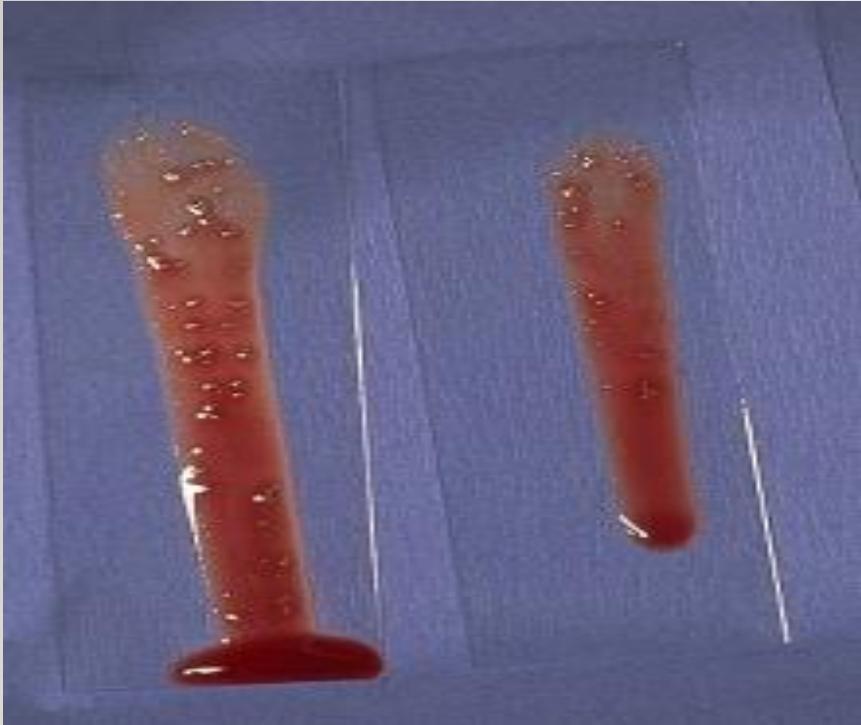
Can be used to expel specimen from T-Lok™ Extraction Cannula.

Unique "forceps" ensure specimen capture and extraction.

THE ASPIRATION



WAS THE ASPIRATE ADEQUATE?



RETRIEVING THE BIOPSY



CORE BIOPSY



Emily: Bone Marrow Biopsy
<http://theladypastor.blogspot.com/2015/08/bone-marrow-biopsy.html>



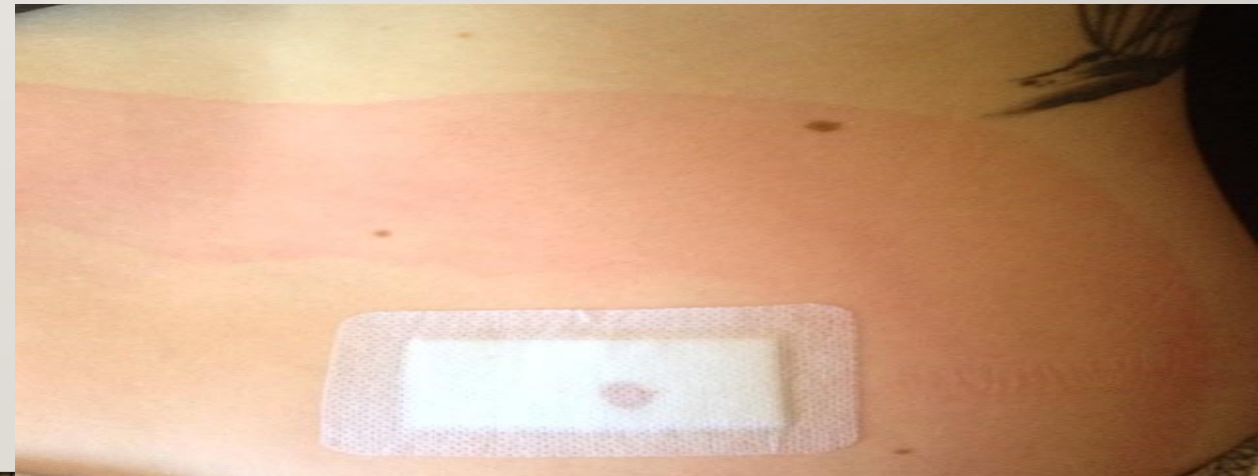
**Touch Preparations Stained
(touch preps)**



Overview, Preliminary Assessment, Collection Site
<http://emedicine.medscape.com/article/207575-overview>

POST PROCEDURE CARE

- Clean site with alcohol (remove as much betadine as you can)
- Apply pressure dressing
- Have patient lay on back for 30 minutes to keep pressure on area
- Remove bandage in 24 hours



POST-PROCEDURE COMPLICATIONS

- Very rare to have significant side effects outside of local pain
 - Survey of 54,890 biopsies done in the UK and only 26 adverse events were reported (0.0005% of patients)
- Most common adverse events
 - Hemorrhage (laceration of the gluteal artery, retroperitoneal bleed)
 - Infection

WHAT TESTS ARE YOU SENDING?

Test	Purpose
Bone Marrow Morphology	Stained slides from aspirate and biopsy to assess cellularity and constituents of marrow components
Cytochemistry/Histochemistry	Differentiate Leukemia's
Flow Cytometry/Immunochemistry	Analyze surface markers to determine lineage and stage of differentiation
Cytogenetics Analysis/FISH	Determine Chromosomal Abnormalities
Iron Stain	Assess iron stores
Molecular Studies (PCR, TCR/BCR rearrangement)	Establish Clonality Assessing MRD
Microbiology	FUO Work-up: Bacterial/Viral/Fungal/AFB cultures

QUESTIONS

