

2.5.3

Pathology Reforms

2.5.3

Blueprinting

UG

Pathology - Blue Printing (UG)

Clinical application of the topic	Weight
No or little clinical application	1
Moderate clinical application	2
High clinical application	3

Weightage of level %

Phase	Recall	Comprehension	Application
I	50	25	25
II	30	45	25
III	25	50	25



Paper 1

- | Sr. No. | Topic |
|---------|---|
| 1 | Introduction to pathology |
| 2 | Cell injury, Cell adaptation, cell death |
| 3 | Inflammation and healing |
| 4 | Hemodynamic disorders |
| 5 | Genetic and Pediatrics disorders |
| 6 | Diseases of immunity including amyloidosis |
| 7 | Neoplasia |
| 8 | Infection, Environmental and Nutritional Disorders |
| 9 | Introduction to hematopoietic system and Disorders, of erythroid series |
| 10 | Disorders of leucocytes and lymphoreticular tissue |
| 11 | Disorders of platelets, bleeding disorders and transfusion medicine |



1st Term End		W	marks allotted	MCQs	LAQs	BAQs
Sr. No.	Topic					
1	Intoduction to pathology	1	3	2	-	1
2	Cell injury, Cell adaptation, cell death	1	3	2	-	1
3	Inflammation and healing	3	3.5	3	-	1
4	Hemodynamic disorders	2	3.5	3	-	1
5	Genetic and Pediatrics disorders	2	3	2	-	1
6	Diseases of immunity including amyloidosis	3	11.5	3	1	1
7	Neoplasia	3	11.5	3	1	1
8	Infection, Environmental and Nutritional Disorders	3	5.5	3	-	2
9	Intoduction to hematopoietic system and Disorders of erythroid series	3	11.5	3	1	1
10	Disorders of leucocytes and lymphoreticular tissue	3	3	2	-	1
11	Disorders of platelets, bleeding disorders and transfusion medicine	2	3	2	-	1
	Total		62	28	3	12

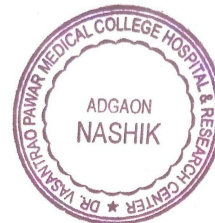


Paper 2

Sr. No.	Topic
1	Blood vessels and heart
2	Lung
3	Head and neck
4	GIT
5	Liver, biliary tract and pancreas
6	Kidney
7	Urinary tract and male genital system
8	female genital system
9	Breast
10	Endocrine system
11	Skin, Bones, Joints and Soft tissue tumors
12	Peripheral nerve and skeletal muscles
13	CNS



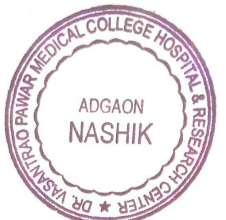
2nd Term End						
Sr. No.	Topic	W	marks allotted	MCQs	LAQs	BAQs
1	Blood Vessels and Heart	2	3	2	-	1
2	Lung	2	11	2	1	1
3	Head and Neck	2	3	2	-	1
4	GIT	3	3	2	-	1
5	Liver, Biliary Tract and Pancreas	3	9	2	1	-
6	Kidney	3	3.5	3	-	1
7	Urinary Tract and Male Genital System	2	11	2	1	1
8	Female Genital System	3	3	2	-	1
9	Breast	3	3	2	-	1
10	Endocrine System	2	3.5	3	-	1
11	Skin, Bones, Joints and Soft Tissue Tumors	2	3	2	-	1
12	Peripheral Nerve and Skeletal Muscles	2	3	2	-	1
13	CNS	2	3	2	-	1
	Total		62	28	3	12



Paper 1 (Prelims)		W	marks allotted	MCQs	LAQs	SAQs
Sr. No.	Topic					
1	Intoduction to pathology	1	0.5	1	-	-
2	Cell injury, Cell adaptation, cell death	1	1	2	-	-
3	Inflammation and healing	3	5	2	-	1
4	Hemodynamic disorders	2	4.5	1	-	1
5	Genetic and Pediatrics disorders	2	4.5	1	-	1
6	Diseases of immunity including amyloidosis	2	4.5	1	-	1
7	Neoplasia	3	7	2	1	-
8	Infection, Environmental and Nutritional Disorders	3	6.5	1	1	-
9	Intoduction to hematopoietic system and Disorders of erythroic series	3	6.5	1	1	-
10	Disorders of leucocytes and lymphoreticular tissue	3	5	2	-	1
11	Disorders of p atelets, bleeding disorders and transfusion medicir e	2	5	2	-	1
	Total		50	16	3	6

Paper 2 (Prelims)		W	marks allotted	MCQs	LAQs	SAQs
Sr. No.	Topic					
1	Blood Vessels and Heart	2	1	2	-	-
2	Lung	2	4.5	1	-	1
3	Head and Neck	2	0.5	1	-	-
4	GIT	3	6.5	1	1	-
5	Liver, Biliary Tract and Pancreas	3	5	2	-	1
6	Kidney	3	6.5	1	1	-
7	Urinary Tract and Male Genital System	2	5	2	-	1
8	Female Genital System	3	6.5	1	1	-
9	Breast	3	4.5	1	-	1
10	Endocrine System	2	4.5	1	-	1
11	Skin, Bones, Joints and Soft Tissue Tumors	2	4.5	1	-	-
12	Peripheral Nerve and Skeletal Muscles	2	0.5	1	-	-
13	CNS	2	0.5	1	-	-
	Total		50	16	3	

Professor & HOD
Department of Pathology
Dr. Vasant Rao Pawar Medical College
Adgaon, Nashik



2.5.3

Blueprinting

PG



M. V. P. Samaj's
Dr. Vasant Rao Pawar Medical College, Hospital &
Research Centre, Adgaon, Nashik - 3
Department of Pathology (Pg)

PAPER I:

Total Marks – 110 (with options)

LAQs – 2x25 = 50

SAQs – 6 x 10 = 60 (5 out of 6)

Total: 110

Sr.No.	Topic	W	Marks allotted	SAQs	LAQs
1	General Pathology	2	20	2	-
2	General Neoplasia	3	35	1	1
3	Immunopathology	2	20	2	-
4	Cytology - I	3	35	1	1

PAPER II:

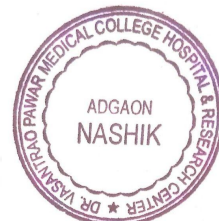
Total Marks – 110 (with options)

LAQs – 2x25 = 50

SAQs – 6 x 10 = 60 (5 out of 6)

Total: 110

Sr.No.	Topic	W	Marks allotted	SAQs	LAQs
1	Systemic Pathology	3	65	4	1
2	Systemic Neoplasia	3	45	2	1



PAPER III:

Total Marks – 110 (with options)

LAQs – 2x25 = 50

SAQs – 6 x 10 = 60 (5 out of 6)

Total: 110

Sr.No.	Topic	W	Marks allotted	SAQs	LAQs
1	Hematology	3	55	3	1
2	Transfusion Medicine	2	10	1	-
3	Immunohematology	2	35	1	1
4	Recent Advances	2	10	1	-

PAPER IV:

Total Marks – 110 (with options)

LAQs – 2x25 = 50

SAQs – 6 x 10 = 60 (5 out of 6)

Total: 110

Sr.No.	Topic	W	Marks allotted	SAQs	LAQs
1	Clinical Pathology	3	45	2	1
2	Chemical Pathology	3	45	2	1
3	Pathology of infectious diseases	2	10	1	-
4	Recent Advances	2	10	1	-



PB

2.5.3

OSPE

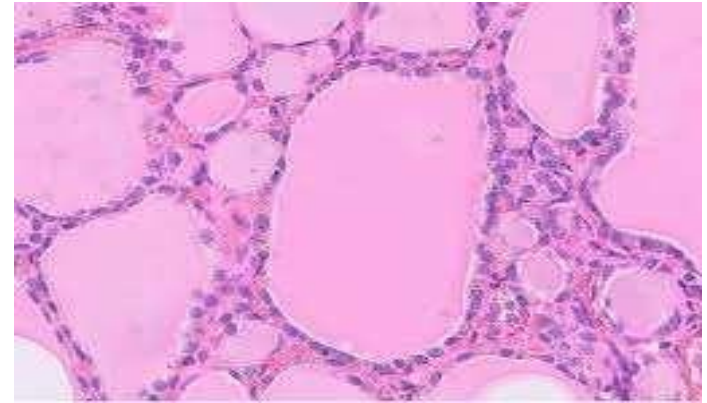
UG

OSPE (UG)

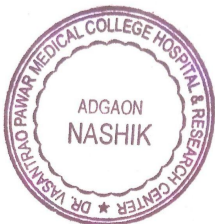
Department of Pathology

Examine the microscopic picture of the lesion involving the thyroid and answer the following:

- Identify the lesion
- Name 2 microscopic features.

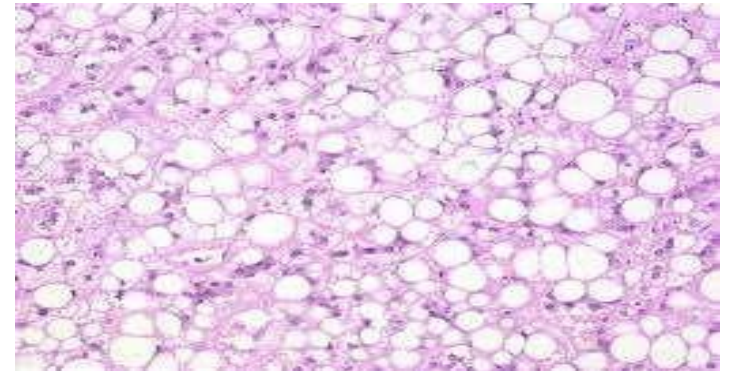


Answers	Marks Allotted
Colloid goitre	1
Presence of Colloid filled follicles	0.5
Flattened epithelium	0.5

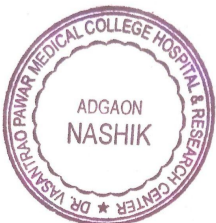


Examine the microscopic picture of the lesion involving the liver and answer the following:

- Identify the lesion
- Name 2 special stains used for identifying the lesion

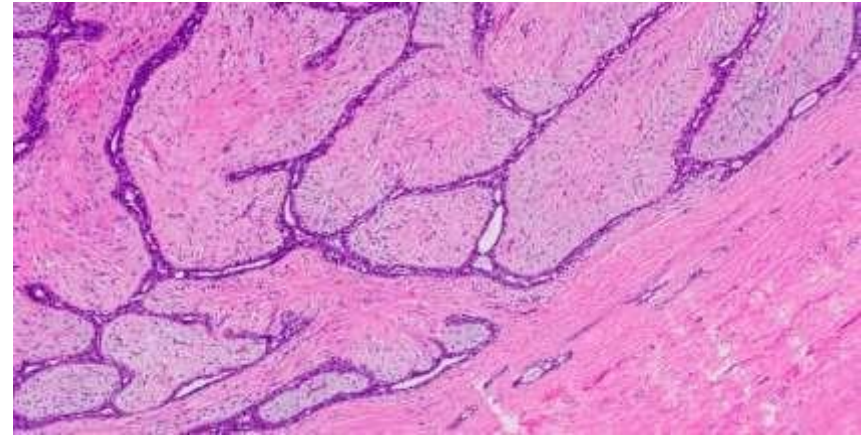


Answers	Marks Allotted
Fatty liver	1
Sudan Black B	0.5
Oil Red O	0.5

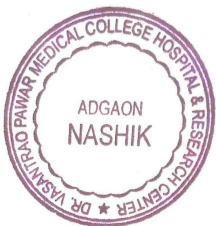


Examine the microscopic picture of the lesion involving the breast and answer the following:

- Identify the lesion
- Name 2 microscopic types

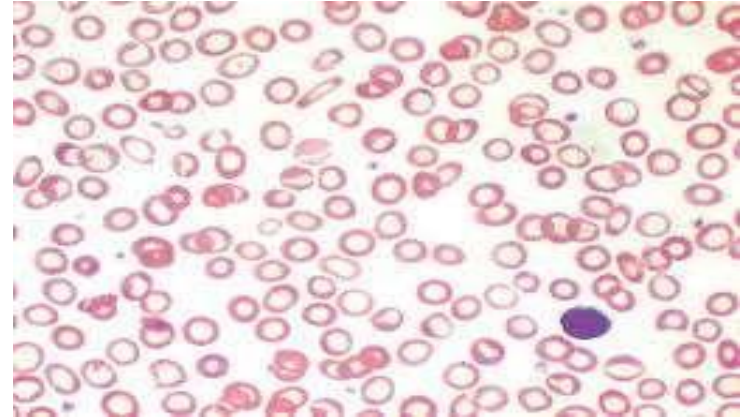


Answers	Marks Allotted
Fibroadenoma of Breast	1
Pericanalicular	0.5
Intracanalicular	0.5



Identify the hematological slide and answer the following questions

- Identify the type of anemia
- Give 2 causes

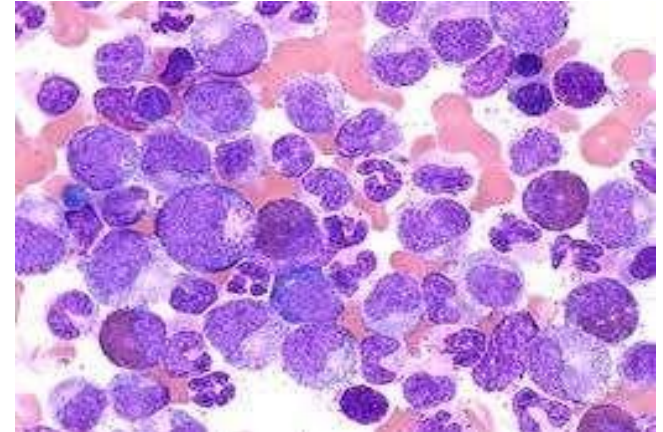


Answers	Marks Allotted
Microcytic, Hypochromic Anemia	1
Iron deficiency anemia	0.5
Thalassemia	0.5



Identify the hematological slide and answer the following questions

- Identify the hematological malignancy
- Which genetic translocation is associated with this condition?



Answers

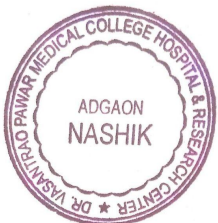
Marks Allotted

CML(Chronic Myeloid Leukemia)

1

adelphia Chromosome – t(9,22)

1



Identify the gross specimen and answer the following questions:

- Identify the gross specimen
- Give 1 etiological factor



Answers

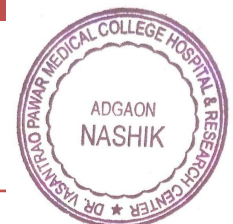
Marks Allotted

Linitus Plastica (Diffuse adenocarcinoma of stomach)

1

Mutation in e-cadherin gene

1



Identify the gross specimen and answer the following questions:

- Identify the gross specimen
- Mention 2 types



Answers

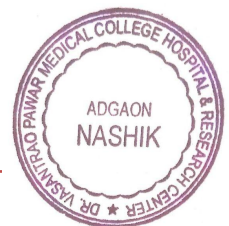
**Marks
Allotted**

Leiomyoma of uterus(Fibroids)

1

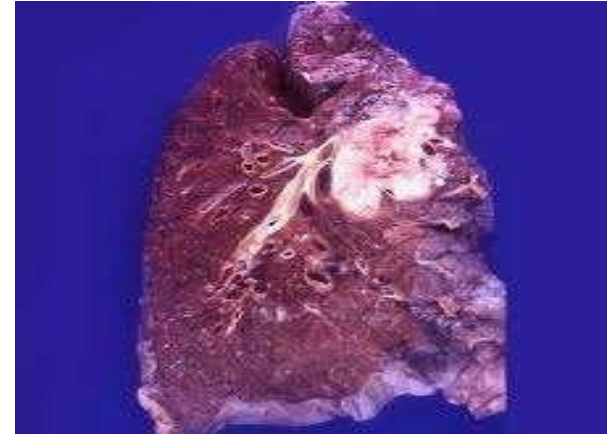
Submucosal, Intramural,
Subserosal

0.5 each



Identify the gross specimen and answer the following questions:

- Identify the gross specimen
- Give 2 etiological factors



Answers

Marks Allotted

Lung Carcinoma

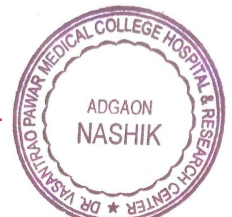
1

Smoking

0.5

Asbestos exposure

0.5



Identify

- Identify the above instrument and mention its use.
- Give 2 features of Blood Transfusion reactions



Answers

Marks Allotted

Antisera

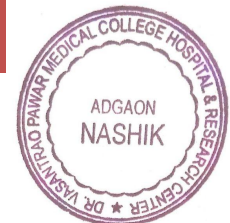
0.5

Used in ABO and Rh grouping

0.5

Fever, Chills, Hematuria

0.5 each



Identify

- Identify the above instrument?
- Mention its use?



Answers

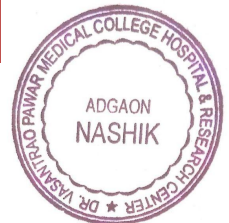
Neubauer Chamber

Marks Allotted

1

Used for counting RBCs, WBCs, Platelets, Sperms and Cells in a fluid

0.5 each



Identify

- Identify
- Mention 2 uses?



Answers

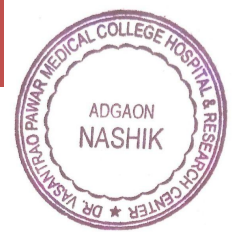
Marks Allotted

EDTA bulb

1

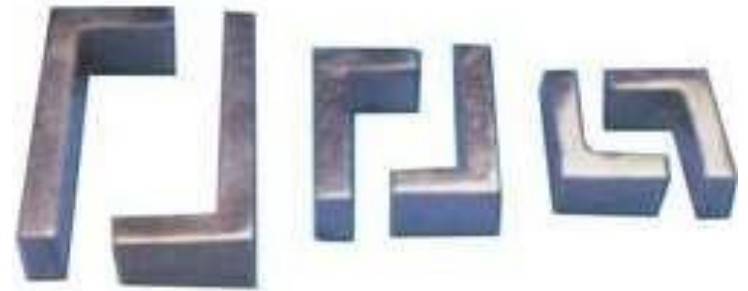
CBC, Hemoglobin estimation, Blood Grouping, Reticulocyte count

0.5 each



Identify

- Identify the above instrument?
- Mention its use?



Answers

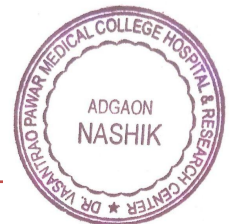
Marks Allotted

L-moulds (Leuckhart's embedding
mould)

1

Used for making tissue blocks in wax

1



Identify

- Identify the above instrument?
- Mention 2 conditions where it is used



Answers

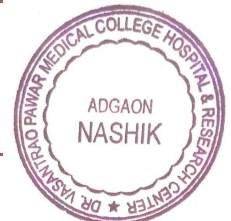
Marks Allotted

Bone Marrow aspiration needle (Salah)

1

Bone Marrow aspiration in cases of leukemias , anemias , pancytopenia

0.5 each



60 years old Chronic alcoholic male patient

Presenting Symptoms : Weakness
Dyspnoea on exertion
Reddish bald tongue

Clinical Examination : Pallor +
Glossitis +

Laboratory Investigations

1) CBC : Hemoglobin : 9.0gm / dl (N M- 12.0 to 18.0 gm/dl)
MCV : 116 fl (N 80-100 fl)
MCH : 30 pg. (N 26-34 pg)

PBS : WBC - Hypersegmented neutrophils present
RBC - Macrocytes present

2) Bone Marrow Exam : Hypercellular marrow
Erythroid Hyperplasia
Megaloblastic erythropoiesis

Questions

1. State the type of Anaemia
2. Mention the blood test to confirm the diagnosis

Answers

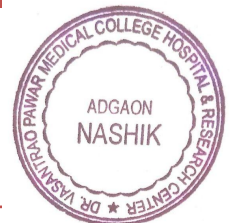
Marks Allotted

Megaloblastic Anemia

1

Serum Vitamin B12 and folate levels

1



22 years old Male

Presenting Symptoms : Low grade fever since 10 days
Headache since 2 days
Vomiting since 2 days

Clinical Examination : Altered Consciousness

Laboratory Investigations

CSF Examination revealed :

Physical Exam : Slightly Turbid appearance
Cobweb Present

Chemical Exam : Proteins – 120.00 mg/ dl.(Normal 15 -45 mg / dl)
Glucose - 35.00 mg /dl (Normal 40 -60 mg / dl)

Microscopic Exam : Total nucleated cells : 250 / cumm
100% lymphocytes
(Normal 0-5 lymphocytes / cumm)

Gram stain : Negative

ZN stain : Acid Fast Bacilli Present -

- Questions**
1. Give your diagnosis .
 2. Mention one supporting evidence for your diagnosis.

Answers

Marks Allotted

Tubercular Meningitis

1

Presence of acid fast bacilli on ZN stain/Lymphocytic predominance in CSF/Cobweb appearance

1



2.5.3

OSPE

PG

OSPE (PG)

Department of Pathology

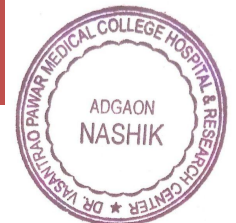
Exercise No. 1 Discuss the clinical case and opine

(15)

54 year old male presented with history of swelling over right great toe. On examination toe is inflamed and tender. There is history of trauma 4 days back, also patient gave history of weight gain of 4 kg in last 3 months. There is history of polyuria. GPE : Normal, BP : 140/90 mm Hg, Pulse : 82/min, Systemic examination: normal

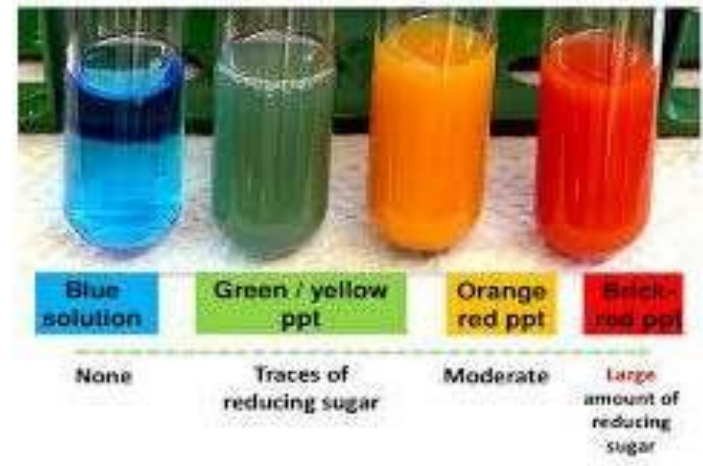
- What is the differential diagnosis ?
- Is there any role of detection of microalbuminuria ?

Answers	Marks Allotted
Diabetes Mellitus, Metabolic syndrome	7.5
Indicates early renal damage in DM	7.5



Exercise No. 2 Perform physical and chemical examination of urine (15)

- State your findings in the given urine sample.
- What is 24 hr urine sample?



Answers

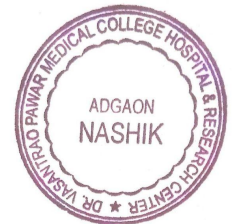
Marks Allotted

Sugar present

7.5

The first morning sample is discarded. All subsequent samples are collected in 2 liter bottle with cap. The last sample is the next days 1st morning sample

7.5



Exercise No. 3 Perform the biochemical tests on the given sample (15)

- What is likely diagnosis ?
- Should liver biopsy be carried out in this case ?

Answers

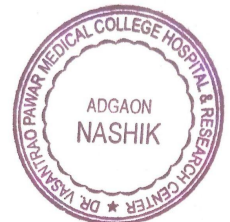
Marks Allotted

Serum bilirubin : 12 mg%,
direct bilirubin : 3 mg%, SGOT : 40unit/L,
SGPT : 48unit/L
Obstructive jaundice

7.5

Contraindicated

7.5



Exercise No. 4 Serology – Perform the allotted tests

(15)

- What type of HIV tests are available?
- What is the window period ?



Answers

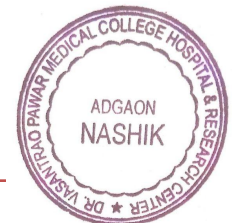
Marks Allotted

Rapid HIV test
ELISA Test
Western Blot Test

7.5

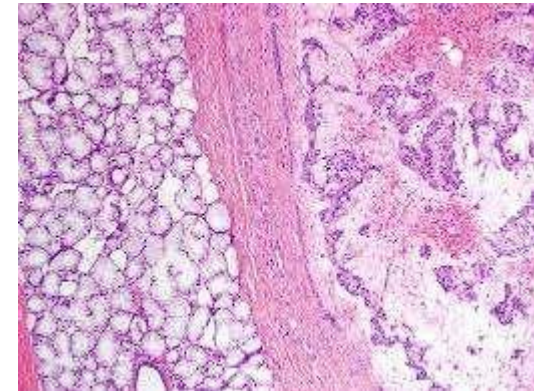
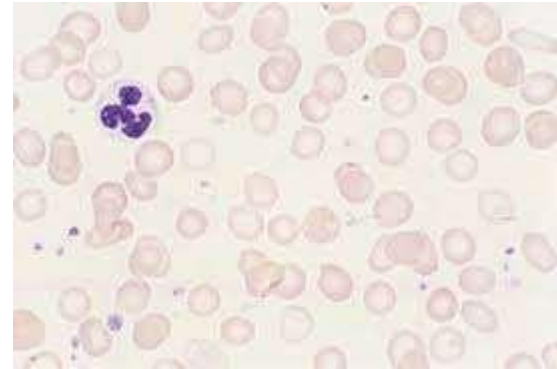
Time between exposure and when
HIV antibodies can be detected

7.5

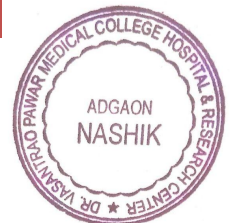


Exercise No. 5 Diagnosis and discussion of cytology and hematology slides (75)

- 34 year old lady admitted with weakness and dyspnoea since 8 months.
- 45 year male, presented with swelling in right parotid region.



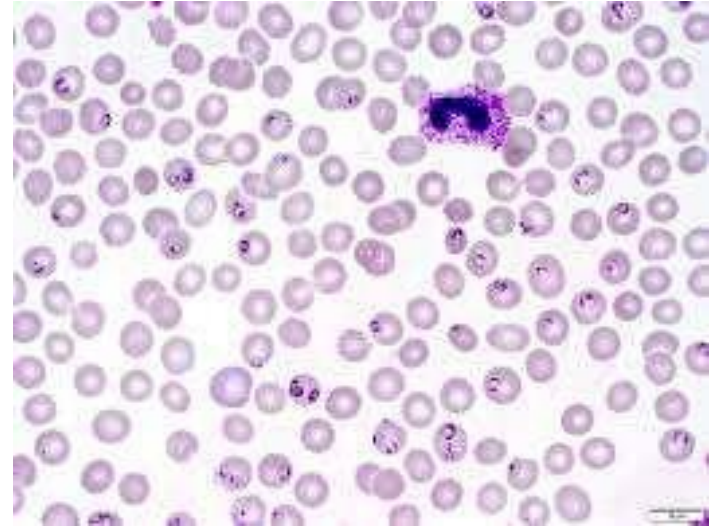
Answers	Marks Allotted
Iron Deficiency Anemia	5
Pleomorphic Adenoma	5



Exercise No. 6 Hematology exercise

(15)

- Stain the given peripheral smear and opine

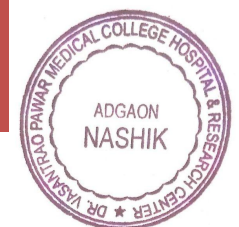


Answers

Marks Allotted

P. Falciparum malaria
RBCs with single to multiple rings

7.5



- Interpret cell counter printout
- Give diagnosis

Answers

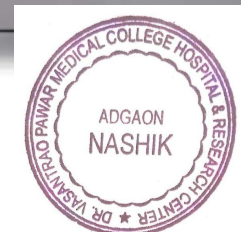
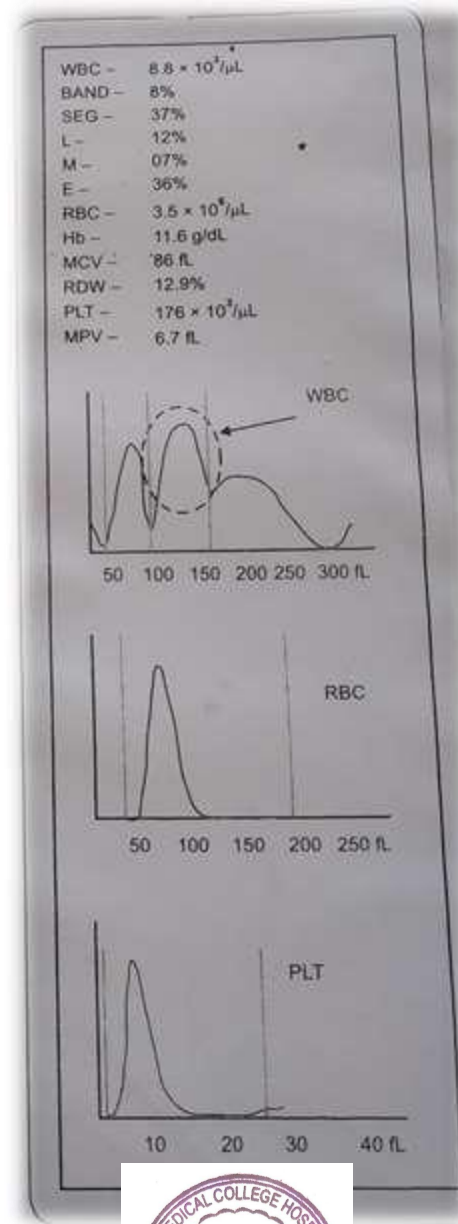
Marks Allotted

WBC : Increased mixed cell curve which peaks at 95 fL due to Eosinophilia
 RBC : Unremarkable
 Platelet : Unremarkable

Eosinophilia

4

3.5



Exercise No. 7 Perform the special hematology test (15)

Blood grouping and Coombs test (Direct and Indirect)

- For blood grouping, which method is better – tube or slide method ?
- Which are the immune hemolytic anemias in which Coombs test is indicated ?
- What test is employed to detect low level antibodies against red cells ?



Answers

Marks Allotted

Tube method

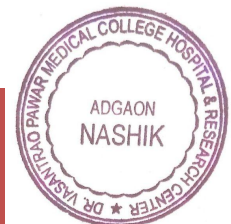
5

Autoimmune Hemolytic anemia,
Systemic Lupus Erythematosus,
Paroxysmal Cold Hemoglobinuria

5

Micro-coomb's test
Coomb's test using Gel cards

5



Exercise No. 8 Examine Autopsy organs and discuss the diagnosis

(20)

- 30 year old male came with history of high grade fever, cough and breathlessness. Patient was admitted and died within 12 hours of admission. Autopsy was performed.

Organs submitted : Heart, Lung, Liver,
Spleen, Kidney

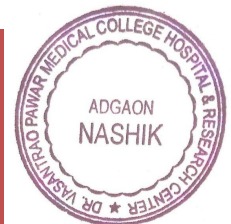


Answers

Marks Allotted

Lobar Pneumonia

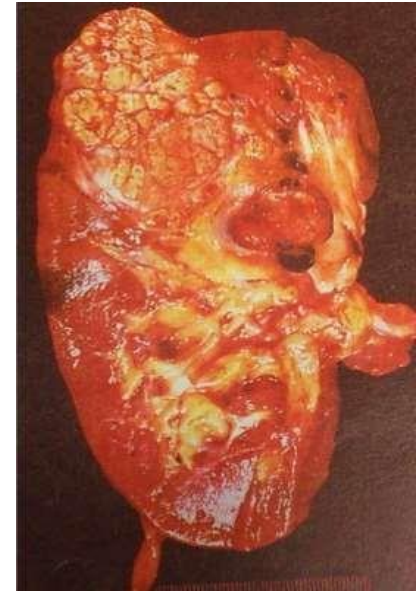
20



Exercise No. 9 Examine gross organs and discuss the diagnosis

(35)

- 55 year old female came with right ovarian mass.
- 40 year old male came with history of lump in right lumbar region with recurrent hematuria on and off



Answers

Marks Allotted

Enlarged solid ovary with uniform white smooth cut surface – **Ovarian Fibroma**

5

The tumor shows cystic hemorrhagic and yellowish areas, variegated appearance – **Renal Cell Carcinoma**

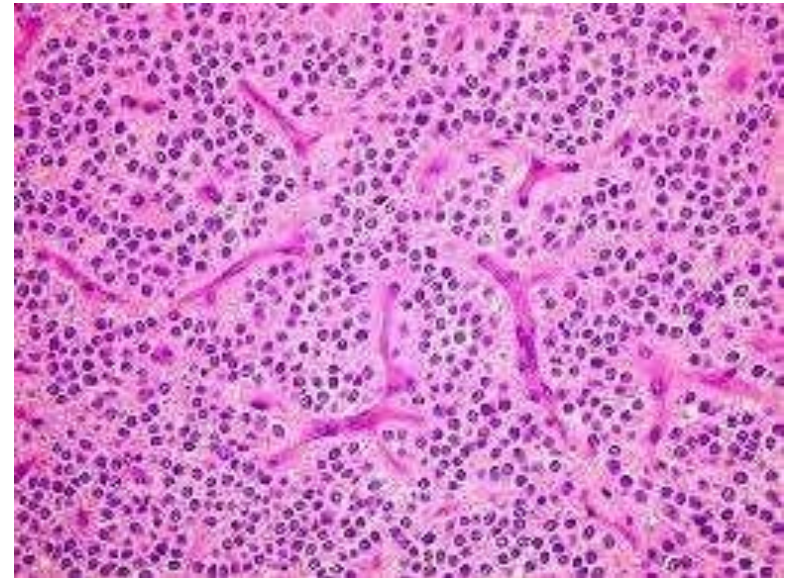
5



Exercise No. 10 Histotechniques

(15)

- Perform H & E stain on given slides
- Enumerate special stains



Answers

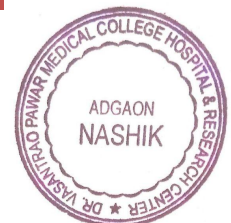
Marks Allotted

Slide stained

7.5

Masson's trichrome stain,
Van Gieson stain, PAS stain,
Masson's Fontana Stain

7.5



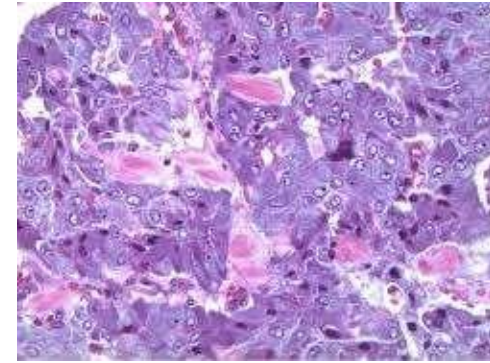
Exercise No. 11 Histopathology Slides – Diagnosis and Discussion

(125)

- 67 year old male with ulcerated nodule on nose.



- 35 year old male with hypertension and abdominal mass.



Answers

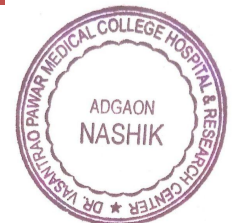
Marks Allotted

Basal Cell Carcinoma – Nodular and cystic proliferation of basaloid cells with peripheral palisading

5

Pheochromocytoma – Nests of large polygonal; cells with abundant granular cytoplasm and eccentric nuclei. Nests are separated by thin vascular septa.

5



2.5.3

Self

Assessment

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VASANTDADA NAGAR, ADGAON, NASHIK-3

Department of Pathology

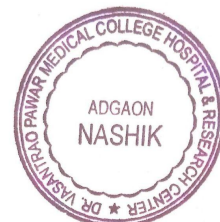
Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- *Dr Aakash Gupta JR III*
2. Subject:-
 1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of *BMA & Bx* process you have done?
Consent taken, procedure explained to the patient. Under all aseptic precautions, procedure for Bone marrow aspiration & Bx done
2. What did you like about the procedure?
3. Did you take written consent of the patient before the procedure? *Yes*
4. What were you able to do well? *Aspiration & Biopsy*
5. What difficulty did you arise? *No difficulty*
6. What safety precautions did you take? *All aseptic precautions*
7. How did you assess patient before doing the procedure? *vital parameters & blood reports*
8. What did you learn about yourself from this procedure? *I was quite confident*
9. What was situation of your mind during this procedure? *calm & composed*
10. Are you afraid of this procedure? *NO*
11. Did you do this procedure under senior guidance? *NO*
12. How did you feel after the completion of the procedure? *Happy*
13. What precautions did you take during the procedure? *All aseptic precautions*
14. What instructions did you the nurse after the procedure? *check for procedure bleeding from procedure site*
15. Did you come across any complication during/ after the procedure? *No*
16. How did you follow the patient after the procedure? *checked for bleeding site*
17. What did you learns from the procedure? *The proper procedure to pe*
18. until now how many of these procedures have you done? *more than 100*
19. Did you get confidence of doing this procedure? *Yes*
20. How do you tackle the complication of the procedure? *assessing the patient and treat accordingly*



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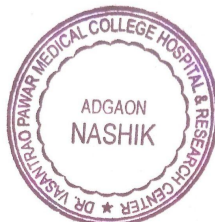
Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr Ankeesh Gupta JR III
2. Subject:-
 1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNAC process you have done?
Oral consent taken and procedure well explained to the patient
procedure performed under all aseptic precautions
2. What did you like about the procedure? Quick & very accurate
3. Did you take written consent of the patient before the procedure? No
4. What were you able to do well? The whole procedure
5. What difficulty did you arise? No difficulty
6. What safety precautions did you take? All aseptic precautions
7. How did you assess patient before doing the procedure? —
8. What did you learn about yourself from this procedure? —
9. What was situation of your mind during this procedure? Calm
10. Are you afraid of this procedure? No
11. Did you do this procedure under senior guidance? No
12. How did you feel after the completion of the procedure? Happy
13. What precautions did you take during the procedure? All aseptic precautions
14. What instructions did you the nurse after the procedure? —
15. Did you come across any completion during/ after the procedure? No
16. How did you follow the patient after the procedure? —
17. What did you learn from the procedure? —
18. until now how many of these procedures have you done? > 1000
19. Did you get confidence of doing this procedure? Yes
20. How do you tackle the complication of the procedure? —



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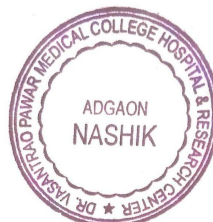
Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr. Baviskar Priyanka Sadas hir JR II
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of ^{Bone Marrow} Aspiration of Biopsy process you have done?
Consent taken, procedure explained to patient - I under all aseptic precautions
2. What did you like about the procedure? Bone marrow aspiration & Bi done.
3. Did you take written consent of the patient before the procedure? Yes
4. What were you able to do well? Bone Marrow aspiration
5. What difficulty did you arise? During taking bone marrow biopsy in obese patients.
6. What safety precautions did you take? All aseptic precautions are taken before & during procedure.
7. How did you assess patient before doing the procedure? CBC, PT/INR, BT, CT, history.
8. What did you learn about yourself from this procedure? Cooperation of patient is important.
9. What was situation of your mind during daily this procedure? Confident.
10. Are you afraid of this procedure? NO
11. Did you do this procedure under senior guidance? Yes.
12. How did you feel after the completion of the procedure? Contented.
13. What precautions did you take during the procedure? Aseptic precautions.
14. What instructions did you the nurse after the procedure? To look for bleeding from the site of procedure. & vitals.
15. Did you come across any completion during/ after the procedure? NO
16. How did you follow the patient after the procedure? I call the resident & ask if the patient is ok.
17. What did you learns from the procedure? How to avoid unnecessary complications.
18. until now how many of these procedures have you done? 22
19. Did you get confidence of doing this procedure? Yes
20. How do you tackle the complication of the procedure? Till now no complications has occurred.



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Self-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr. Barikar Priyanka Sadashiv. JR II
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNA process you have done?
Procedure explained to patient & under all aseptic precautions FNA done.
2. What did you like about the procedure? Can be done on OPD basis.
3. Did you take written consent of the patient before the procedure? Yes.
4. What were you able to do well? Needling
5. What difficulty did you arise? Difficulty arises in paediatric age group as they are not co-operative
6. What safety precautions did you take? Gloves, green shield, mask, sterile syringe & needles, spirit swab.
7. How did you assess patient before doing the procedure? Did he/she look fit or not.
8. What did you learn about yourself from this procedure? Procedure is safe on OPD basis
9. What was situation of your mind during daily this procedure? I was confident
10. Are you afraid of this procedure? No
11. Did you do this procedure under senior guidance? No
12. How did you feel after the completion of the procedure? Contented
13. What precautions did you take during the procedure? Patient should not move.
14. What instructions did you the nurse after the procedure? —
15. Did you come across any completion during/ after the procedure? Yes, patient fainted.
16. How did you follow the patient after the procedure? Keep the patient for 10 min in lying down position.
17. What did you learn from the procedure? It is easy & less time consuming to get reports & diagnoses.
18. until now how many of these procedures have you done? 68-70
19. Did you get confidence of doing this procedure? Yes
20. How do you tackle the complication of the procedure? I gave glucose to patient I kept him waiting for 1/2 hr. I then I sent him to when he felt good.



Department of Pathology

Self-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr Anupama Ramakant Kolte. SR II
2. Subject:-
✓ 1. Bone Marrow Aspiration and Biopsy
2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of Bone marrow aspiration and biopsy process you have done? consent taken under all aseptic precaution and local anaesthesia. Bone marrow aspiration done with bone marrow aspiration needle.
2. What did you like about the procedure? Bone marrow aspiration from PS II is safer than from sternal site.
3. Did you take written consent of the patient before the procedure? yes.
4. What were you able to do well? Bone marrow aspiration.
5. What difficulty did you arise? procedure is difficult in obese patients.
6. What safety precautions did you take? I used sterile gloves and antoclaved tray for procedure.
7. How did you assess patient before doing the procedure? History, CBC, PT, ENR was seen.
8. What did you learn about yourself from this procedure? procedure is painful and needs patient's cooperation.
9. What was situation of your mind during daily this procedure? - I was calm & confident.
10. Are you afraid of this procedure? NO.
11. Did you do this procedure under senior guidance? I did this procedure under seniors' guidance only once.
12. How did you feel after the completion of the procedure? I get satisfaction.
13. What precautions did you take during the procedure? - Lateral position given to pt & knee flexed.
14. What instructions did you the nurse after the procedure? I asked nurse to look for bleeding, pulse, Blood pressure, SpO₂.
15. Did you come across any completion during/ after the procedure? NO.
16. How did you follow the patient after the procedure? I asked respective resident about complications.
17. What did you learns from the procedure? This procedure needs guidance.
18. until now how many of these procedures have you done? 26
19. Did you get confidence of doing this procedure? yes
20. How do you tackle the complication of the procedure?
Till now my patient complained of pain sometime but I did not come across other complications of procedure.



Department of PathologySelf-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

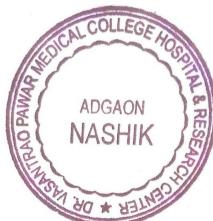
1. Name of Students:- Dr. Arun Kumar R. Kolate. JR II
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
✓ 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNAC process you have done?
2. What did you like about the procedure? This procedure do not need hospitalization
3. Did you take written consent of the patient before the procedure? yes
4. What were you able to do well? yes. I was able to do needling well.
5. What difficulty did you arise? Pediatric patient are not cooperative.
6. What safety precautions did you take? Sterile gloves, disposable syringe & needle used
7. How did you assess patient before doing the procedure? I asked whether patient was on full stomach or not?
8. What did you learn about yourself from this procedure? → Procedure is safe on OPD basis
9. What was situation of your mind during daily this procedure? I was confident.
10. Are you afraid of this procedure? NO
11. Did you do this procedure under senior guidance? yes.
12. How did you feel after the completion of the procedure? I was satisfied.
13. What precautions did you take during the procedure? I took all aseptic precaution.
14. What instructions did you the nurse after the procedure?
15. Did you come across any complication during/ after the procedure? yes. Pt got giddiness
16. How did you follow the patient after the procedure? I asked respective resident about his health.
17. What did you learn from the procedure? One should be very confident while
18. until now how many of these procedures have you done? 55 | Performing procedure.
19. Did you get confidence of doing this procedure? yes
20. How do you tackle the complication of the procedure?

I asked patient 'whether he was getting giddiness? Then After pt answered I raised palpated pulse. and assured patient. and raised his leg was feeling better get up. ~~from~~

one minute. Patient I asked him to



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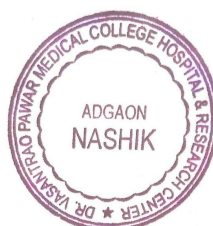
Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr Gayatri Soneta - JR I.
2. Subject:-
 1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of ^{Bone marrow} Aspiration & Biopsy process you have done? Consent taken, Procedure explained to the patient. Under all aseptic precautions procedure for Bone marrow aspiration & Bx done.
2. What did you like about the procedure? Helpful in diagnosis
3. Did you take written consent of the patient before the procedure? Yes
4. What were you able to do well? Yes
5. What difficulty did you arise? Difficulty in insertion of BMA needle in obese patient.
6. What safety precautions did you take? All aseptic precautions.
7. How did you assess patient before doing the procedure? Vitals, CBC, PT-INR.
8. What did you learn about yourself from this procedure? Skill development.
9. What was situation of your mind during this procedure? Calm, Collected, Confident.
10. Are you afraid of this procedure? NO
11. Did you do this procedure under senior guidance? Yes
12. How did you feel after the completion of the procedure? Confident.
13. What precautions did you take during the procedure? All aseptic precautions.
14. What instructions did you the nurse after the procedure? monitoring for bleeding.
15. Did you come across any complication during/ after the procedure? No pain relief.
16. How did you follow the patient after the procedure? check for vitals, no active bleeding from site.
17. What did you learn from the procedure? Bone marrow aspiration & Bx is a skillful procedure, needs practice & patience.
18. until now how many of these procedures have you done? 09.
19. Did you get confidence of doing this procedure? Yes.
20. How do you tackle the complication of the procedure? Proper assessment, Following protocol.



Department of Pathology

Self-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

1. Name of Students:- *Dr Gayatri Soneta JRI*
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
2. *FNA*

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNA process you have done?

*Consent taken, Procedure explained to patient, under all aseptic precautions
procedure of FNA done.*

2. What did you like about the procedure? *Helpful in ruling out differentials.*

3. Did you take written consent of the patient before the procedure? *for swelling*

4. What were you able to do well? *Yes*

5. What difficulty did you arise? *Difficulty during needling for sample*

6. What safety precautions did you take? *All aseptic precautions.*

7. How did you assess patient before doing the procedure? *Vital parameters, USG local*

8. What did you learn about yourself from this procedure? *Needs Patience, skill.*

9. What was situation of your mind during this procedure? *Confident, calm.*

10. Are you afraid of this procedure? *No.*

11. Did you do this procedure under senior guidance? *Yes.*

12. How did you feel after the completion of the procedure? *Confident.*

13. What precautions did you take during the procedure? *All aseptic precautions*

14. What instructions did you the nurse after the procedure? *Watch for bleeding,*

15. Did you come across any complication during/ after the procedure? *No. Vital monitoring*

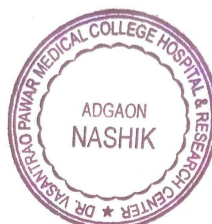
16. How did you follow the patient after the procedure? *Vital monitoring*

17. What did you learn from the procedure? *Skilful procedure, needs patience,*

18. until now how many of these procedures have you done? *27 practice.*

19. Did you get confidence of doing this procedure? *Yes.*

20. How do you tackle the complication of the procedure? *Proper assessment.*



Department of Pathology

Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr. Pooja Khandave TR-1
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNA process you have done?

under all aseptic precaution procedure of FNA done. Consent taken procedure explained to pt

2. What did you like about the procedure?

3. Did you take written consent of the patient before the procedure? No

4. What were you able to do well?

5. What difficulty did you arise? Proper fixing of mobile swelling

6. What safety precautions did you take? Use of gloves & mask. Clean the FNA site with aseptic solution

7. How did you assess patient before doing the procedure?

8. What did you learn about yourself from this procedure? Supplementary procedure to do. No need of OT. Anesthesia.

9. What was situation of your mind during daily this procedure?

10. Are you afraid of this procedure? No

11. Did you do this procedure under senior guidance? Yes

12. How did you feel after the completion of the procedure?

13. What precautions did you take during the procedure? Proper exposure of swelling. Done under all aseptic condition

14. What instructions did you the nurse after the procedure?

15. Did you come across any completion during/ after the procedure? Till date No.

16. How did you follow the patient after the procedure? Ask pt to report back after

17. What did you learn from the procedure? Quick procedure, cost 3 days. Accuracy nearly same as histopath

18. until now how many of these procedures have you done? 25

19. Did you get confidence of doing this procedure? Yes

20. How do you tackle the complication of the procedure?

- Instruct pt to have proper breakfast.
- before doing FNA procedure.
- Explain pt entire procedure, in order to reduce anxiety regarding procedure



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Self-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

1. Name of Students:-

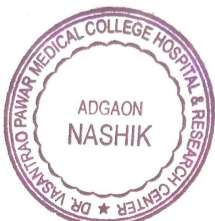
2. Subject:-

1. Bone Marrow Aspiration and Biopsy
2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of BMA ABMB process you have done?
Consent taken (procedure explained to pt under all aseptic precaution procedure of BMA ABMB done
2. What did you like about the procedure? → to do biopsy
3. Did you take written consent of the patient before the procedure? Yes.
4. What were you able to do well? Obtaining Proper position of pt. & to do.
5. What difficulty did you arise? BMA & bp of obese pt
6. What safety precautions did you take? Take proper & detailed H/O pt. use of autoclave needle & take all aseptic precaution
7. How did you assess patient before doing the procedure? Inspect pt.
8. What did you learn about yourself from this procedure? Take vitals
9. What was situation of your mind during daily this procedure? —
10. Are you afraid of this procedure? No.
11. Did you do this procedure under senior guidance? At starting, procedure is done under guidance of Sr. Now pr. done with CO-TR.
12. How did you feel after the completion of the procedure? proper position, use of pulse ox. use of autoclave needle, sterile & govern all aspects precaution
13. What precautions did you take during the procedure?
14. What instructions did you the nurse after the procedure?
15. Did you come across any completion during/ after the procedure?
16. How did you follow the patient after the procedure? Look after Aspiration site. if there is any bleeding inform to concern dr.
17. What did you learns from the procedure? —
18. until now how many of these procedures have you done? 10.
19. Did you get confidence of doing this procedure? — Yes.
20. How do you tackle the complication of the procedure?

- Take detailed H/O. A any other
- co-morbidities.
- procedure explained to pt. in order to reduce anxiety.
- If there is bleeding, give pressure on that side.
- if it continues, inform to concern doctor.



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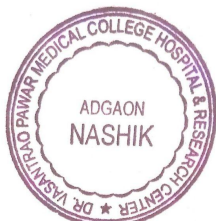
Department of Pathology

Self-Assessment form for PG Medical Students
Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr. VINEK. A. KOLAGE - Resident I
2. Subject:-
1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of FNA process you have done?
consent taken, procedure explained to patient, under all aspects precaution, procedure of FNA done.
2. What did you like about the procedure? Helpful in diagnosis.
3. Did you take written consent of the patient before the procedure? yes.
4. What were you able to do well? Procedure → Making Smear
5. What difficulty did you arise? Needling,
6. What safety precautions did you take? All aspects precaution → Gloves, sterility, new needle, cotton.
7. How did you assess patient before doing the procedure? patient USG, vital parameters, Triple H.
8. What did you learn about yourself from this procedure? This procedure is very
9. What was situation of your mind during daily this procedure? Useful for diagnosis.
10. Are you afraid of this procedure? NO
11. Did you do this procedure under senior guidance? Yes.
12. How did you feel after the completion of the procedure? Confident
13. What precautions did you take during the procedure? All aspects precaution.
14. What instructions did you the nurse after the procedure? Watch for vital parameters
15. Did you come across any completion during/ after the procedure? Bleeding at the
16. How did you follow the patient after the procedure? watch for site vital parameters
17. What did you learns from the procedure? New procedure, which helpful for diagnosis.
18. until now how many of these procedures have you done? 20
19. Did you get confidence of doing this procedure? Yes
20. How do you tackle the complication of the procedure? with helpful senior guidance.



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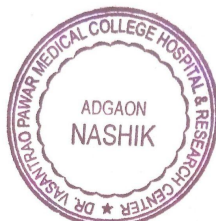
Self-Assessment form for PG Medical Students

Feedback form of PG Students for Self-Assessment

1. Name of Students:- Dr. Vivek. A. Kolage - JR II
 2. Subject:-
 1. Bone Marrow Aspiration and Biopsy
 2. FNA

Check List to be filled up after the procedure by the PG Students:-

1. Give the brief description of ^{Bone marrow} ~~Aspiration & Biopsy~~ process you have done? Consent taken, procedure explained to the patient. Under all aspects precaution, procedure for Bone marrow aspiration & Bi done.
2. What did you like about the procedure? Helpful for diagnosis.
3. Did you take written consent of the patient before the procedure? Yes.
4. What were you able to do well? Aspiration of Bone marrow.
5. What difficulty did you arise? Difficulty while take Bone marrow biopsy.
6. What safety precautions did you take? All aspects precaution.
7. How did you assess patient before doing the procedure? Vital parameters.
8. What did you learn about yourself from this procedure? That procedure can be done well with practice.
9. What was situation of your mind during daily this procedure?
10. Are you afraid of this procedure? NO
11. Did you do this procedure under senior guidance? Yes
12. How did you feel after the completion of the procedure? Bleeding at the site.
13. What precautions did you take during the procedure? All aspects precaution.
14. What instructions did you the nurse after the procedure? Vital parameters, bleeding at site.
15. Did you come across any completion during/ after the procedure? Not yet.
16. How did you follow the patient after the procedure? Vital parameters.
17. What did you learns from the procedure? That procedure can be easily done with practice.
18. until now how many of these procedures have you done? 4
19. Did you get confidence of doing this procedure? Yes
20. How do you tackle the complication of the procedure? Tackle the complication with help of senior guidance



2.5.3

Skill

Modules



Department of pathology

Blood collection

Phlebotomy is the process of making incision in a vein

OBJECTIVE :

At the end of the procedure, a proper, complication free collection of blood must be achieved.

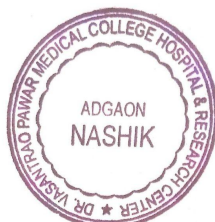
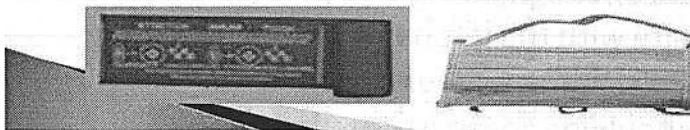
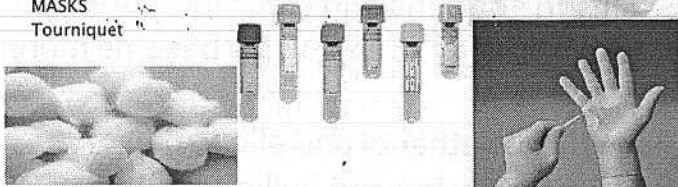
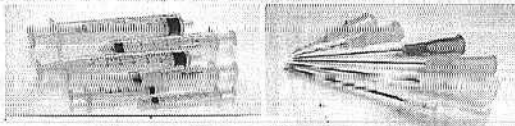
Indications of blood collection-

- For all routine investigation eg. CBC, LFT, RFT, RBS
- Required for blood cross matching, before blood transfusion.

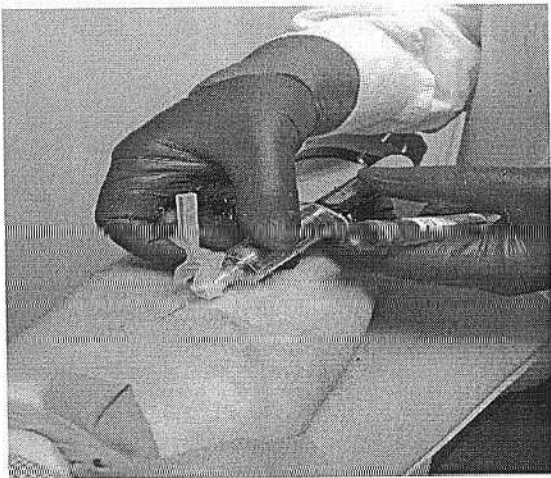
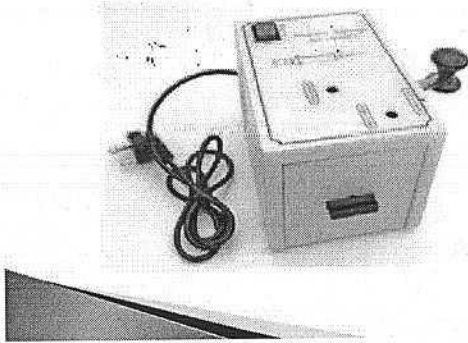
Material require for blood collection:

REAGENTS & EQUIPEMENTS

SYRINGES
NEEDLES
VACUTAINERS
GLOVES
MASKS
Tourniquet

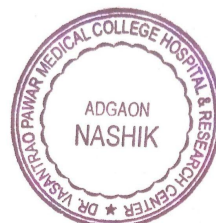


NEEDLE DESTROYER



Procedure:

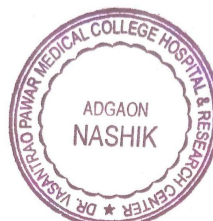
- Due to the ease of access, blood is best obtained from the veins of the antecubital fossa. A rubber tourniquet (18 inches long \times 3/4 or 1 inch in adults and 12 inches \times 1/8 inch in children) is applied to the upper arm.
- It should not be too tight and should not remain in place for more than two minutes. Patient is asked to make a fist so that veins become more prominent and palpable.
- Venepuncture site is cleansed with 70% ethanol and allowed to dry. The selected vein is anchored by compressing and pulling the soft tissues below the puncture site with the left hand.
- Sterile, disposable needles and syringes should be used for venepuncture. Needle size should be 19- to 21-gauge in adults and 23-gauge in children. Venepuncture is performed with the bevel of the needle up and along the direction of the vein. Blood is withdrawn slowly. Pulling the plunger quickly can cause hemolysis and collapse of the vein. Tourniquet should be released as soon as the blood begins to flow into the syringe.



- When the required amount of blood is withdrawn, the patient is asked to open his/her fist. The needle is withdrawn from the vein. A sterile cotton gauze is pressed over the puncture site. Patient is asked to press the gauze over the site till bleeding stops.
- The needle is detached from the syringe and the required amount of blood is carefully delivered into the tube containing appropriate anticoagulant (see later). If the blood is forced through the needle without detaching it, hemolysis can occur. Containers may be glass bottles or disposable plastic tubes with caps and flat bottom.
- Blood is mixed with the anticoagulant in the container thoroughly by gently inverting the container several times. The container should not be shaken vigorously as it can cause frothing and hemolysis.
- Check whether the patient is feeling faint and bleeding has stopped. Cover the puncture site with an adhesive bandage strip. After use, disposable needles should be placed in a puncture-proof container for proper disposal. Recapping of needle by hand can cause needle-stick injury. The container is labeled. Time of collection should be noted on the label. Sample should be sent immediately to the laboratory with accompanying properly filled order form.

Precautions

1. Blood is never collected from an intravenous line or from the arm being used for intravenous line (since it will dilute the blood sample). Blood is not collected from a sclerosed vein and from an area with hematoma.
2. Tourniquet should not be too tight and should not be applied for more than 2 minutes as it will cause hemoconcentration and alteration of test results.
3. Puncture site should be allowed to dry completely after cleaning with alcohol (before performing the venepuncture).
4. Tourniquet should be released before removing the needle from the vein (to prevent hematoma formation).
5. To avoid hemolysis, blood is withdrawn gradually, a small-bore needle should not be used, and the needle is detached from the syringe before dispensing blood into the container.



6. All blood samples are considered as infectious and proper precautions should be observed while collecting blood either from a vein or a skin puncture. Anticoagulated blood sample should be tested within 1-2 hours of collection. If this is not possible, sample can be stored in a refrigerator at 4-6°C for maximum of 24 hours. After the sample is taken out of refrigerator, it should be allowed to return to room temperature, mixed properly, and then tested.

Complications

1. Failure to obtain blood: This happens if vein is missed, or excessive pull, is applied to the plunger causing collapse of the vein.
2. Occurrence of hematoma, thrombosis, thrombophlebitis, abscess, or bleeding.
3. Transmission of infections like hepatitis B or human immunodeficiency virus if reusable needles and syringes, which are not properly sterilised, are used.

Assessment:

- Was the procedure carried out successfully?
- Was the procedure carried out with aseptic precautions?
- Was the patient reassured?
- Were the complications explained to the patient?
- Did the patient receive appropriate after care?



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BONE MARROW ASPIRATION AND BIOPSY PROCEDURE

Bone marrow – Site of hematopoiesis, located within cavities of bones consists of hematopoietic cell.

OBJECTIVE:

At the end of the procedure, bone marrow aspirate and biopsy samples must be obtained which will aid in the diagnosis and further management.

Indications of bone marrow aspiration-

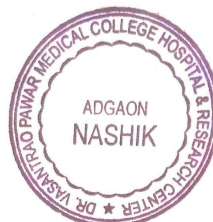
- Unexplained cytopenia.
- Unexplained polycythaemia.
- Suspected acute leukaemia, myelodysplastic syndrome, myeloproliferative disorder, plasma cell dyscrasia, chronic lymphoid leukaemia, pyrexia of unknown origin, storage disorder.
- To monitor response to therapy & to assess remission.
- For investigation such as flow cytometry, cytogenetic or molecular analysis

Indication of bone marrow biopsy:

- Repeated failure of aspiration
- Suspected aplastic anemia, myelofibrosis, focal lesions like granuloma, metastatic deposits or infiltrates, hairy cell leukemia; staging of lymphoma, and bone disorder such as osteoporosis.

Contraindications:

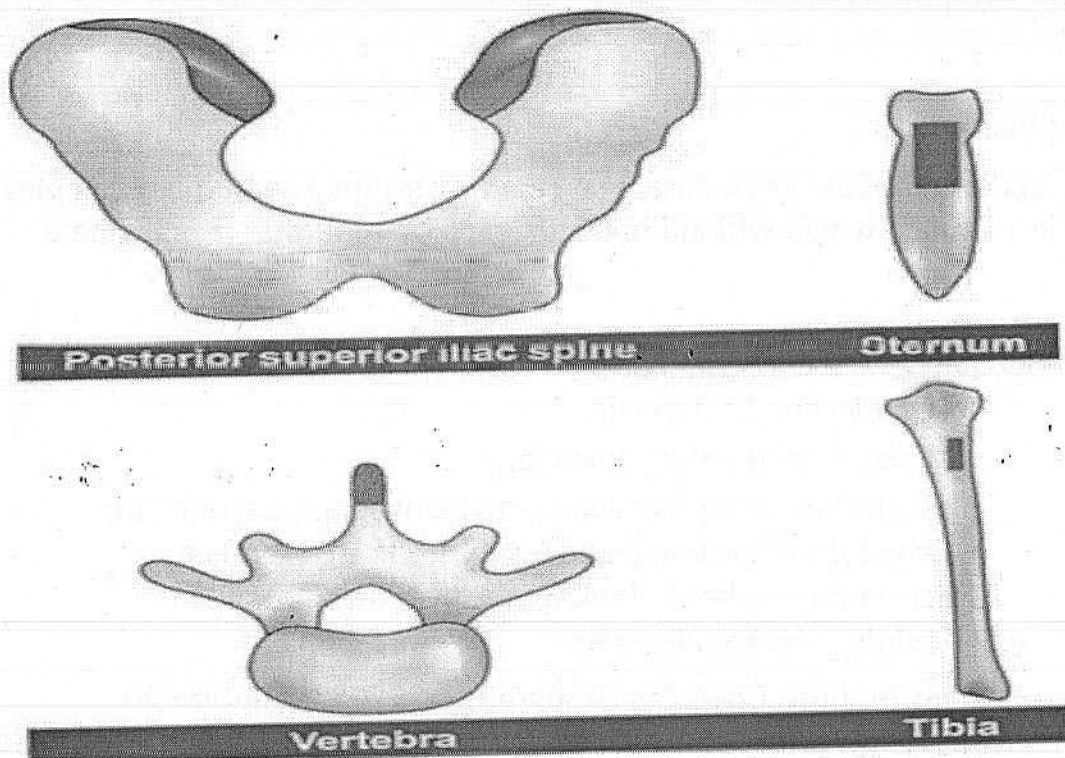
- Haemophilia



- Coagulation disorder

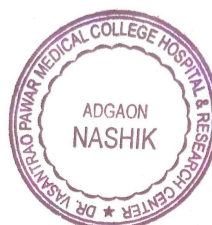
Sites for bone marrow aspiration and biopsy

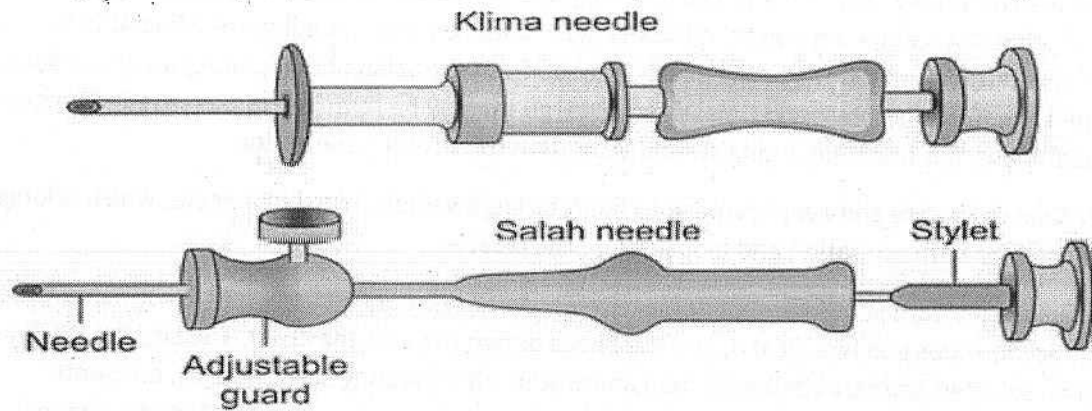
- Iliac spine or crest
- Sternum
- Spinous process of lumbar vertebrae
- Tibia



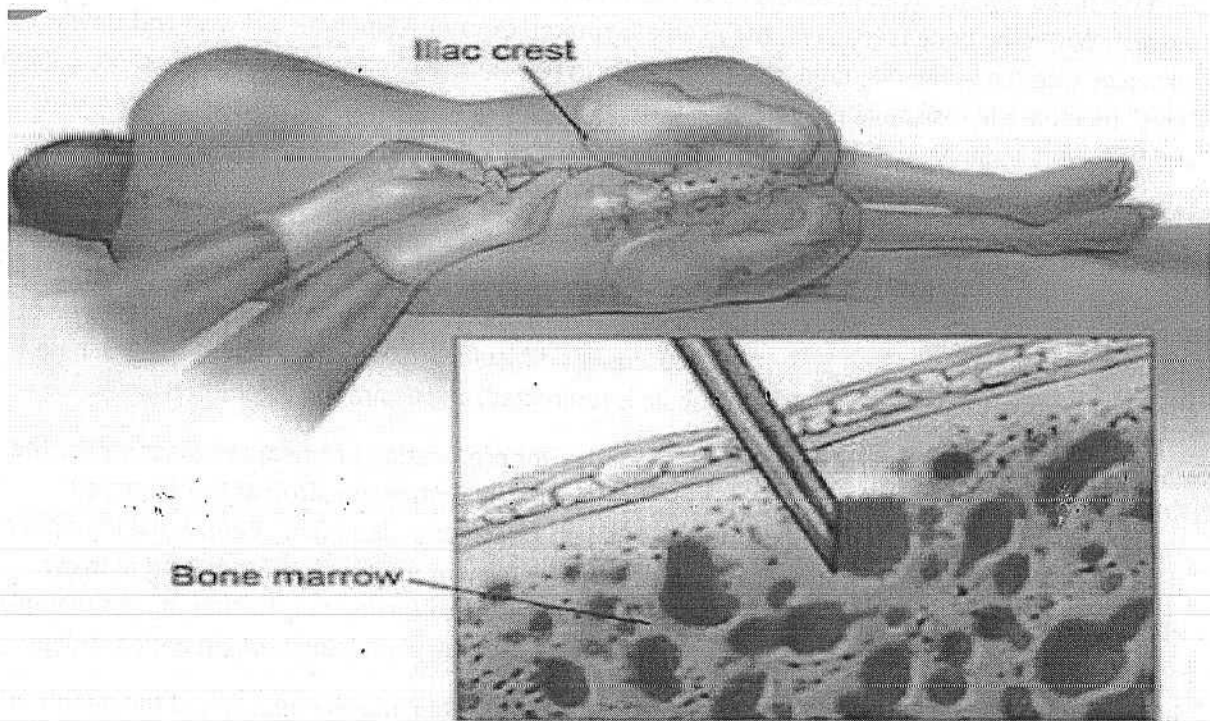
Method:-

- Informed consent should be taken before the procedure.
- Sterile tray should be prepared.



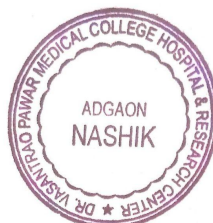


Procedure:



Bone Marrow Aspiration :

1. An informed consent should be obtained before the procedure. Bone marrow aspiration or biopsy should be performed by the physician. An assistant is required for preparation of smears.
2. A sterile tray should be prepared containing autoclaved bone marrow aspiration needle, sterile disposable syringes with needles, local anesthetic solution, clean and dry glass slides, spreader slide, gloves, drapes, gauze, and a skin antiseptic solution. All aseptic precautions should be observed during the procedure. Various bone marrow aspiration needles are available. Salah and Klima



needles are commonly used. Salah needle has a guard with a side screw, while Klima needle has a guard which screws along the length of the needle. Guards on these needles are adjustable to control the depth of penetration. The guard may slip from the Salah needle during the procedure. For aspiration from iliac crest and tibia, if required, guard may be removed to increase the length of the needle. Guard is essential during sternal aspiration to prevent penetration

deeper than necessary and avoid damage to heart or large vessels. Jamshidi needle, which is longer, can be used for both aspiration and biopsy from iliac crest.

3. For aspiration from posterior superior iliac spine, patient should lie on one side with back towards the physician, knees and hips flexed, and the knees drawn towards the chest. The site for aspiration should be selected and scrubbed with soap and water. After wearing sterile gloves, antiseptic solution is applied in a circular fashion, moving from center towards periphery. A sterile drape is placed over the area with its central opening over the aspiration site.

4. Skin and periosteum are infiltrated with a local anesthetic. First inject beneath the skin surface and advancing the needle further, a larger amount is injected into the periosteal surface. 5. After waiting for 5 minutes for anesthesia to take effect, bone marrow aspiration needle is inserted along with the fitted stylet. (Stylet prevents blockage of lumen of needle by tissues through which needle passes). When the bone is reached, the needle is rotated clockwise and anticlockwise and slowly advanced into the bone, maintaining steady and firm pressure. When the marrow is reached, a slight "give" (decrease in resistance) will be noted. The needle is advanced for 1-2 mm into the marrow and the stylet is removed. If the needle is placed correctly, it will be fixed by the surrounding bone and will remain rigid and unmoving.

6. A 5 or 10 ml syringe is attached to the needle and a small amount of marrow is aspirated (till the first drop of blood appears i.e. 0.25-0.50 ml) by quickly pulling the plunger of the syringe. Aspiration is associated with sharp pain (suction pain). Aspiration of larger amount of blood causes dilution of marrow sample by peripheral blood with subsequent difficulties in interpretation of smears. If no material is aspirated, stylet is replaced, needle is redirected, and aspiration attempted again.

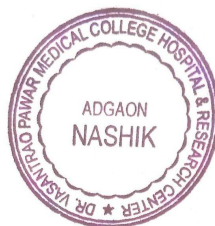
7. The syringe should be handed over to the assistant for preparation of smears on glass slides. The smears should be made promptly, before clotting occurs, by putting one drop of the aspirated material near one end of a glass slide and spreading it similar to a blood film. Before making smears, any excess blood on the slide should be sucked away by Pasteur pipette, leaving behind marrow particles. If immunophenotyping or cytogenetic analysis is to be carried out, further marrow sample should be aspirated in a second syringe and dispensed in a tube containing heparin anticoagulant.

8. After completion of aspiration, the stylet should be reinserted into the needle and the needle is removed. Sterile gauze is placed over the site and light pressure is applied till bleeding ceases. A larger dressing is then applied.

Bone Marrow Trephine Biopsy:

Preparation of the patient and local anesthesia are similar to aspiration. A short acting intravenous sedative is preferable in adults. In children, general anesthesia may be necessary. Percutaneous trephine biopsy of bone marrow is commonly obtained from posterior superior iliac spine

Jamshidi or Islam needles are commonly used. Often, bone marrow aspiration and biopsy are combined together; aspiration is carried out first followed by biopsy. If both aspiration and biopsy are combined, then, after aspiration, either



(i) the needle is advanced a little further (1-3 cm) into the bone, or
(ii) the needle is withdrawn and reinserted through the same skin incision but placed at a different site in the bone (about 1 cm away). For biopsy, the needle should be advanced through the bone rotating it clockwise 10 times. The needle should be removed by anticlockwise rotation. The biopsy should be removed gently from the hub end of the needle by inserting the stylet through the point of the needle. For adequate assessment, biopsy should measure at least 1.6 cm in length. Biopsy should be placed in a fixative solution (either 10% formalin, or preferably Helly's fluid). Dressing should be applied to the site similar to aspiration. Along with bone marrow aspiration/biopsy, peripheral blood smears should be prepared from finger prick and venous blood should be collected in EDTA anticoagulant for cell counts.

Complications of bone marrow aspiration and biopsy

1. Local infection

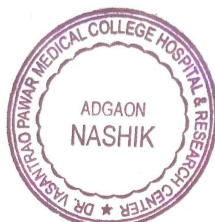
2. Hemorrhage

3. Cardiac tamponade or mediastinitis

Assessment:

- Was the procedure carried out successfully?
- Was the procedure carried out with aseptic precautions?
- Was the patient reassured?
- Were the complications explained to the patient?
- Did the patient receive appropriate after care?


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Fine needle aspiration cytology (FNAC)

Fine needle aspiration cytology was initially conceived as a means to confirm a clinical suspicion of local recurrence or metastasis of known cancer without subjecting the patient to further surgical intervention.

Objective:

At the end of the procedure, adequate aspirate should be obtained which will help in the diagnosis without subjecting patient to a more invasive procedure.

Equipments:

- **Equipment Needles** Standard disposable 27–22-gauge (0.4–0.7 mm), 30–50 mm long needles are suitable for superficial, palpable lesions. We use 25-gauge needles for most lesions, but increasingly 27 gauge for cell-rich and vascular tissues such as lymph nodes and thyroids, in children and in sensitive sites such as orbit, eyelids, genitals and intracutaneous lesion.
- **Syringes and syringe holder** Standard disposable plastic syringes mounted in a syringe holder/pistol grip are suitable for conventional aspiration biopsy. The Cameco Syringe Pistol (Cameco AB, Taby, Sweden) is made to fit 10-cc plastic syringes. The holder leaves one hand free to fix and to feel the target, which allows better precision in placing the needle.
- **Containers and slides** Small sterile containers with tight lids containing physiological saline or a transport medium such as Hank's balanced salt solution should be at hand if a cell suspension or a cell block is needed, or to rinse needles and syringes. Special culture media may be required in certain instances. Glass slides must be clean, dry and free of grease. Slides with frosted ends are convenient for immediate labeling.
- Coated or charged slides for better adhesion are recommended if smears are to be used for immunostaining.



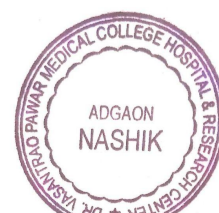
- **Fixatives and stains** Smears are air-dried or wet-fixed. Routine wet fixation is either in 70–90% ethanol or using a commercial spray fixative. Carnoy's fixative has the advantage of lysing red blood cells. Glutaraldehyde and 10% buffered formalin should be available if tissue fragments for EM or for paraffin embedding are obtained.
- Note that formalin must be kept in an airtight container since formalin fumes may adversely affect air-dried smears if stored together. A set of Diff-Quik stains in suitable containers, and a lightweight portable microscope should be available at all times to allow immediate checking of smears for adequacy and an immediate preliminary diagnosis if required. Some pathologists may prefer rapid Papanicolaou staining.

Patient preparation :The procedure should be clearly explained to the patient to assure his/her consent and cooperation.⁵ A formal written consent may be required, at least for deep biopsies. The procedure is usually carried out with the patient supine on an examination couch with easy access from either side. A couch with stirrups is preferable for transrectal and transvaginal biopsy, and an examination chair with adjustable headrest for biopsy of lesions in the head and neck. Simple skin disinfectant using prepacked swabs for injections is adequate for biopsy of superficial lesions. Preparations as for minor surgical procedures (surgical skin disinfectant, fenestrated sterile cloth, sterile gloves) are recommended for transpleural, transperitoneal and bone biopsies.

Anesthesia Pre biopsy sedation is rarely necessary. Atropine is recommended in preparation for transpleural biopsy to prevent the unlikely risk of vasovagal reflex. The biopsy may be coordinated with other procedures that require general anesthesia. Local anesthesia is not often warranted in superficial biopsies. However, we recommend the injection of a local anesthetic in transpleural, transperitoneal and transperiosteal biopsies to prevent uncontrolled movements or jerks by the patient during the procedure and to make multiple passes more acceptable. A spray anesthetic can be used in biopsies of targets in the mouth, pharynx or other mucosal sites. An anesthetic ointment applied at least half an hour before the procedure is useful in children.

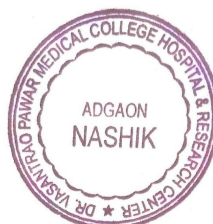
The biopsy procedure

Insertion of the needle With frequent practice and growing experience, the operator acquires the ability to feel the consistency of the tissue through the needle. This helps considerably to position the needle accurately without technical aids. The 'fingertip sensitivity' is much greater when the needle is

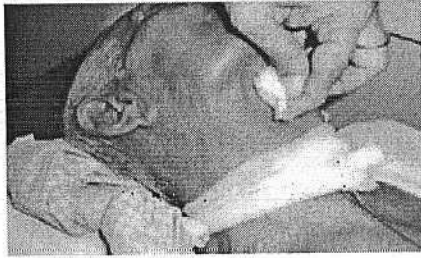


held directly without the interposition of a syringe and holder, as in the non-aspiration technique. A near vertical pathway tends to be less painful and allows better appreciation of depth; a tangential path is preferable in superficial skin lesions and for lesions in the chest wall. The use of radiological imaging techniques to guide deep biopsies. Ultrasonographic (US) guidance may be of value even in palpable lesions. It defines the lesion exactly, gives the optimal depth for biopsy, guides the needle to a solid portion of a complex lesion, and shows the relationship to other anatomical structures such as major vessels, pleura, etc.

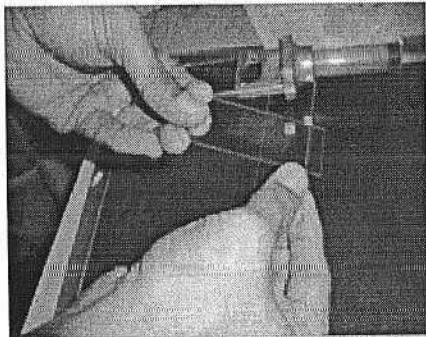
FNB with aspiration The aspiration technique is illustrated diagrammatically in .The negative pressure does not tear cells from the tissue but merely holds the tissue against the sharp cutting edge of the needle, which scrapes or cuts softer tissue components along the track as the needle advances through the Biopsy tissue. Highly cellular tissue components are softer and more friable than the supporting stroma and are selectively sampled. Fibrous stromal components are poorly represented, whereas myxoid stroma is more easily sampled. To increase the yield, the needle should be moved back and forth within the lesion with the negative pressure maintained, more vigorously in fibrous tissues with low cell content. Several passes may be necessary to sample a sufficient number of cells. In highly cellular and vascular tissues such as spleen, lymph nodes, liver and thyroid, a few rapid passes usually suffice. Additional passes mainly increase the amount of blood aspirated, causing dilution of the cellular component. Admixture with blood tends to be less if the needle is moved along the same track rather than in multiple directions. One should never wait to see material enter the hub of the needle, except when evacuating a cyst or an abscess. The ideal aspirate has a creamy consistency due to high cell content in a small amount of fluid and remains inside the needle. The negative pressure must be released before the needle is withdrawn. Even so, part of the aspirate is often drawn up into the hub of the needle (see below). A maintained negative pressure may draw the aspirate into the syringe, which must then be rinsed with fluid to recover the specimen. It can also cause contamination by material aspirated along the track during withdrawal of the needle. Aspiration of US gel in guided FNB of breast lesions is a good example.



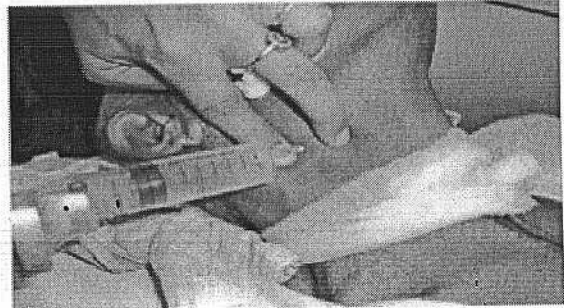
FNAC with aspiration



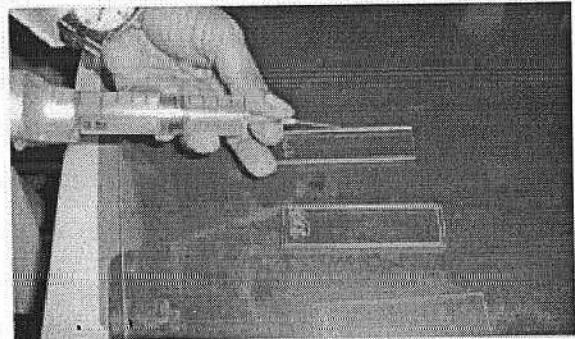
Site of FNAC should be cleaned by spirit swab



The aspirated material is expelled and the smear is made by gently pressing the upper slide on the lower one



Needle is introduced in the swelling and is gently moving to and fro. Simultaneously negative suction is also created by withdrawing the piston



Air is taken in the syringe and needle is reattached



Advantages

- No anesthesia is required .
- No hospitalization is required .
- It is easy to perform and is least invasive
- It is economical.
- Cysts can be aspirated easily & diagnosed with this procedure.
- Multiple attempts or repeating the procedure are possible without inconvenience.
- The results are extremely satisfactory in good hands
- It is a cost effective procedure
- The exact cytological diagnosis is available before definitive surgery is planned

FNAC Complications

- FNA is considered one of the safest invasive diagnostic procedures though complications were estimated at 0.03% of cases.

- 1) Hematomas
- 2) Infection
- 3) Pneumothorax

Assessment:

- Was the procedure carried out successfully?
- Was the procedure carried out with aseptic precautions?
- Was the patient reassured?
- Were the complications explained to the patient?
Did the patient receive appropriate after care?



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2.5.3

Work Place

Based

Assessment



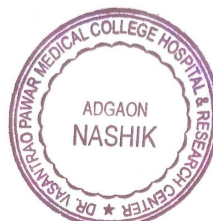
M. V. P. Samaj's
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Department of Pathology

Work Place Based Assessment

Fine Needle Aspiration

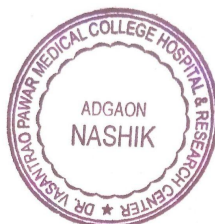
Checklist:

Steps	Yes/No/ Correct answer
Greet the patient	
Is consent taken from the patient?	
Is procedure explained to the patient?	
Is the Preparation done?	
Are the materials required for the procedure collected?	
Is Hand wash done?	
Aseptic precaution taken?	
Is Proper Position given to the patient?	
Selection of proper point for procedure, piercing needle, collecting sample without multiple pricks done?	
Applying pressure after procedure?	
Was the patient monitored during and after the procedure?	
Sending sample in proper and aseptic manner?	



- 1) The students are initially guided and explained by the teacher about the procedure.
- 2) Student observes teacher performing the procedure
- 3) Student performs procedure under teacher's guidance.
- 4) The student independently performs procedure while teacher observes.
- 5) Teacher finally gives feedback regarding the student's performance.

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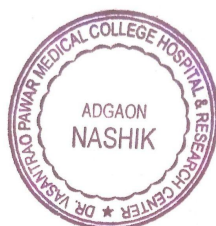
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Dr. Vasant Rao Pawar Medical College, Hospital &
Research Centre, Adgaon, Nashik - 3
Department of Pathology

Work Place Based Assessment

Bone Marrow Aspiration.

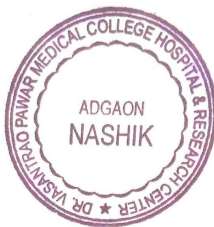
Checklist:

Steps	Yes/No/ Correct answer
Greet the patient	
Is written consent taken from the patient?	
Is procedure explained to the patient?	
Are the complications of the procedure explained to the patient?	
Is the Preparation done?	
Are the materials required for the procedure collected?	
Is Hand wash done? Aseptic precaution taken? Painting and drapping done?	
Is Proper Position given to the patient?	
Selection of proper point for procedure, piercing needle, collecting sample without multiple pricks done?	
Applying pressure after procedure?	
Was the patient monitored during and after the procedure?	
Was the aftercare explained to the patient?	



- 1) The students are initially guided and explained by the teacher about the procedure.
- 2) Student observes teacher performing the procedure
- 3) Student performs procedure under teacher's guidance.
- 4) The student independently performs procedure while teacher observes.
- 5) Teacher finally gives feedback regarding the student's performance.

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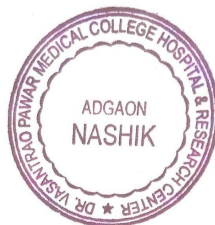
M. V. P. Samaj's
Dr. Vasant Rao Pawar Medical College, Hospital &
Research Centre, Adgaon, Nashik - 3
Department of Pathology

Work Place Based Assessment

Fine Needle Aspiration

Checklist:

Steps	Yes/No/ Correct answer
Greet the patient	
Is written consent taken from the patient?	
Is procedure explained to the patient?	
Is the Preparation done?	
Are the materials required for the procedure collected?	
Is Hand wash done? Aseptic precaution taken?	
Is Proper Position given to the patient?	
Selection of proper point for procedure, piercing needle, collecting sample without multiple pricks done?	
Applying pressure after procedure?	
Was the patient monitored during and after the procedure?	
Sending sample in proper and aseptic manner?	



- 1) The students are initially guided and explained by the teacher about the procedure.
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- 5) Teacher finally gives feedback regarding the student's performance.

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