

## 100-Question Multiple-Choice Quiz on Biopsies with Answers

1. What is a biopsy?

- A. A type of surgery used only to remove tumors
- B. A medical procedure that removes tissue for examination
- C. A blood test used to detect infection
- D. A form of radiation therapy

Answer: B

Explanation: A biopsy is a medical procedure in which tissue or cells are removed from the body and examined under a microscope to help diagnose diseases such as cancer, infections, or inflammatory conditions.

2. Which specialist most commonly examines biopsy tissue samples?

- A. Cardiologist
- B. Neurologist
- C. Pathologist
- D. Radiologist

Answer: C

Explanation: A pathologist studies tissue and cell samples under a microscope to identify abnormalities and make diagnoses.

3. What is the primary purpose of a biopsy?

- A. To replace damaged tissue
- B. To diagnose disease
- C. To provide pain relief
- D. To improve circulation

Answer: B

Explanation: Biopsies are primarily performed to determine whether tissue is normal or diseased.

4. Which of the following conditions is most commonly diagnosed with a biopsy?

- A. Asthma
- B. Hypertension
- C. Cancer
- D. Migraine

Answer: C

Explanation: Biopsies are commonly used to diagnose cancer and determine its type and severity.

5. Which biopsy removes a small cylinder of tissue using a hollow needle?

- A. Shave biopsy
- B. Core needle biopsy
- C. Punch biopsy
- D. Excisional biopsy

Answer: B

Explanation: A core needle biopsy uses a hollow needle to remove a core of tissue for examination.

6. What type of biopsy removes the entire abnormal area?

- A. Fine-needle aspiration biopsy
- B. Incisional biopsy
- C. Excisional biopsy
- D. Punch biopsy

Answer: C

Explanation: An excisional biopsy removes the entire lesion or abnormal area.

7. Which biopsy technique uses a very thin needle to remove cells?

- A. Punch biopsy
- B. Fine-needle aspiration biopsy
- C. Endoscopic biopsy
- D. Skin biopsy

Answer: B

Explanation: Fine-needle aspiration (FNA) uses a thin needle to withdraw cells or fluid.

8. What is a common reason for performing a skin biopsy?

- A. To improve skin texture
- B. To diagnose skin disorders or cancer
- C. To treat burns
- D. To reduce wrinkles

Answer: B

Explanation: Skin biopsies help diagnose skin cancers, infections, and inflammatory conditions.

9. Which imaging method is commonly used to guide biopsies?

- A. Electrocardiography
- B. Ultrasound
- C. Spirometry
- D. EEG

Answer: B

Explanation: Ultrasound is commonly used to guide needles accurately to abnormal tissue.

10. What does a positive biopsy result usually indicate?

- A. No disease is present
- B. The sample was lost
- C. Abnormal or diseased tissue was found
- D. The patient does not need follow-up

Answer: C

Explanation: A positive result means abnormal cells or disease were identified in the tissue sample.

11. Which biopsy is often used for breast lumps?

- A. Bone marrow biopsy
- B. Liver biopsy
- C. Core needle biopsy
- D. Muscle biopsy

Answer: C

Explanation: Core needle biopsy is commonly used to evaluate suspicious breast lumps.

12. Which biopsy involves removing a wedge-shaped portion of tissue?

- A. Incisional biopsy
- B. Needle biopsy
- C. Punch biopsy
- D. Shave biopsy

Answer: A

Explanation: An incisional biopsy removes part of a lesion for examination.

13. What is local anesthesia commonly used for during a biopsy?

- A. To improve healing
- B. To prevent bleeding
- C. To numb the biopsy area
- D. To increase tissue growth

Answer: C

Explanation: Local anesthesia minimizes discomfort by numbing the area being biopsied.

14. Which biopsy is commonly used to diagnose leukemia?

- A. Bone marrow biopsy
- B. Skin biopsy
- C. Punch biopsy
- D. Shave biopsy

Answer: A

Explanation: Bone marrow biopsies help diagnose blood disorders including leukemia.

15. What is one risk associated with biopsies?

- A. Permanent blindness
- B. Infection
- C. Memory loss
- D. Tooth decay

Answer: B

Explanation: Infection is a possible complication, although most biopsies are safe procedures.

16. Which biopsy uses an endoscope to collect tissue samples?

- A. Endoscopic biopsy
- B. Needle biopsy
- C. Open biopsy

D. Shave biopsy

Answer: A

17. What is the purpose of staining biopsy tissue?

- A. To harden the tissue
- B. To color structures for microscopic examination
- C. To reduce odor
- D. To sterilize the tissue

Answer: B

Explanation: Special stains highlight cells and tissue structures under the microscope.

18. Which biopsy is frequently used for prostate evaluation?

- A. Punch biopsy
- B. Prostate needle biopsy
- C. Excisional biopsy
- D. Skin biopsy

Answer: B

Explanation: Prostate biopsies are usually performed using needles guided by ultrasound.

19. What does "benign" mean in a biopsy report?

- A. Cancerous
- B. Infectious
- C. Noncancerous
- D. Untreatable

Answer: C

Explanation: Benign tissue is not cancerous and usually does not spread.

20. What does "malignant" mean in a biopsy report?

- A. Noncancerous
- B. Cancerous
- C. Healing normally
- D. Free of disease

Answer: B

Explanation: Malignant tissue contains cancer cells that may invade nearby tissues or spread.

21. Which biopsy is often used for suspicious lymph nodes?

- A. Fine-needle aspiration
- B. Dental biopsy
- C. Eye biopsy
- D. Muscle biopsy

Answer: A

Explanation: Fine-needle aspiration is commonly used to sample enlarged lymph nodes.

22. Why are biopsies sometimes guided by CT scans?

- A. To reduce cost
- B. To improve needle accuracy
- C. To eliminate anesthesia
- D. To increase blood flow

Answer: B

Explanation: CT guidance helps physicians precisely target abnormal tissue.

23. Which organ is commonly biopsied to diagnose hepatitis?

- A. Heart
- B. Kidney
- C. Liver
- D. Lung

Answer: C

Explanation: Liver biopsies can assess hepatitis severity and liver damage.

24. Which biopsy type removes only the top layer of skin?

- A. Punch biopsy
- B. Shave biopsy
- C. Excisional biopsy
- D. Core biopsy

Answer: B

Explanation: A shave biopsy removes superficial skin layers.

25. What is a frozen section biopsy?

- A. Tissue stored permanently
- B. Tissue examined quickly during surgery
- C. Tissue cooled for pain control
- D. Tissue treated with radiation

Answer: B

Explanation: Frozen section analysis allows rapid diagnosis during surgery.

26. Which biopsy can help diagnose kidney disease?

- A. Renal biopsy
- B. Skin biopsy
- C. Dental biopsy
- D. Eye biopsy

Answer: A

Explanation: A renal biopsy examines kidney tissue for disease or damage.

27. Which of the following is a minimally invasive biopsy method?

- A. Open surgical biopsy
- B. Needle biopsy
- C. Organ removal
- D. Major abdominal surgery

Answer: B

Explanation: Needle biopsies are less invasive than open surgical procedures.

28. What is commonly done before a biopsy procedure?

- A. Administering chemotherapy
- B. Reviewing medical history and medications
- C. Performing dental cleaning
- D. Starting physical therapy

Answer: B

Explanation: Physicians review medications and medical history to reduce complications.

29. Which medication may need to be stopped before a biopsy?

- A. Vitamins
- B. Blood thinners
- C. Antacids
- D. Eye drops

Answer: B

Explanation: Blood thinners can increase the risk of bleeding during biopsies.

30. What symptom after a biopsy should be reported immediately?

- A. Mild soreness
- B. Slight bruising
- C. Heavy bleeding
- D. Temporary fatigue

Answer: C

Explanation: Heavy bleeding may indicate a complication requiring medical attention.

31. Which biopsy is commonly performed using a punch tool?

- A. Bone biopsy
- B. Skin biopsy
- C. Liver biopsy
- D. Breast biopsy

Answer: B

Explanation: Punch biopsies remove small circular sections of skin tissue.

32. What is histopathology?

- A. Imaging of bones
- B. Study of tissue disease under a microscope
- C. Surgical repair of tissue
- D. Measurement of blood pressure

Answer: B

Explanation: Histopathology involves microscopic examination of diseased tissues.

33. Which biopsy result may require additional testing?

- A. Inconclusive result
- B. Benign result
- C. Normal tissue result
- D. Negative culture result

Answer: A

Explanation: Inconclusive findings may require repeat biopsy or further evaluation.

34. What is the purpose of a biopsy margin assessment?

- A. To measure blood pressure
- B. To determine whether abnormal tissue was fully removed
- C. To check heart rhythm
- D. To test lung capacity

Answer: B

Explanation: Margin assessment helps determine if all abnormal tissue has been excised.

35. Which biopsy may be used for lung nodules?

- A. Bronchoscopic biopsy
- B. Skin biopsy
- C. Dental biopsy
- D. Muscle biopsy

Answer: A

Explanation: Bronchoscopic biopsies can sample lung tissue and airway lesions.

36. Which instrument is often used in a punch biopsy?

- A. Scalpel only

- B. Circular blade tool
- C. Laser beam
- D. Bone saw

Answer: B

Explanation: Punch biopsies use a circular blade to obtain tissue samples.

37. Why might sedation be used during a biopsy?

- A. To cure disease
- B. To increase appetite
- C. To reduce anxiety and discomfort
- D. To stop infection

Answer: C

Explanation: Sedation helps patients remain calm and comfortable.

38. What is cytology?

- A. Study of body cells
- B. Study of bones
- C. Study of hormones
- D. Study of muscles

Answer: A

Explanation: Cytology examines individual cells, often from fine-needle aspiration samples.

39. Which biopsy is often done to evaluate gastrointestinal disorders?

- A. Endoscopic biopsy
- B. Bone biopsy
- C. Skin biopsy
- D. Eye biopsy

Answer: A

Explanation: Endoscopy allows physicians to sample tissue from the digestive tract.

40. Which biopsy complication is usually minor and temporary?

- A. Bruising
- B. Organ failure
- C. Paralysis
- D. Blindness

Answer: A

Explanation: Mild bruising is a common minor side effect after biopsies.

41. What is an open biopsy?

- A. A biopsy done without instruments
- B. A surgical procedure involving an incision
- C. A blood collection procedure
- D. A laser treatment

Answer: B

Explanation: Open biopsies require a surgical incision to access tissue.

42. Which biopsy method is least invasive?

- A. Excisional biopsy
- B. Open biopsy
- C. Fine-needle aspiration
- D. Incisional biopsy

Answer: C

Explanation: Fine-needle aspiration uses a very small needle and is minimally invasive.

43. Which imaging technique uses magnetic fields to guide biopsies?

- A. MRI
- B. X-ray
- C. PET scan
- D. Mammography

Answer: A

Explanation: MRI-guided biopsies are used when lesions are best seen with magnetic resonance imaging.

44. What is one reason a biopsy sample may be inadequate?

- A. Too little tissue collected
- B. Excess hydration
- C. High blood sugar
- D. Too much exercise

Answer: A

Explanation: Insufficient tissue can make diagnosis difficult.

45. Which type of biopsy is commonly used for cervical screening abnormalities?

- A. Cervical biopsy
- B. Muscle biopsy
- C. Bone biopsy
- D. Skin biopsy

Answer: A

Explanation: Cervical biopsies evaluate abnormal Pap test findings.

46. What is a stereotactic biopsy commonly used for?

- A. Evaluating breast abnormalities
- B. Treating infections
- C. Measuring bone density
- D. Monitoring heart disease

Answer: A

Explanation: Stereotactic biopsies use imaging to locate breast lesions precisely.

47. Which biopsy may leave a small scar?

- A. Excisional biopsy
- B. Blood test
- C. ECG
- D. Ultrasound scan

Answer: A

Explanation: Surgical biopsies may leave scars depending on tissue removal size.

48. Why are biopsy specimens placed in preservative solutions?

- A. To dissolve tissue
- B. To prevent tissue decay
- C. To increase pain relief
- D. To sterilize equipment

Answer: B

Explanation: Preservatives maintain tissue integrity for accurate examination.

49. What does a biopsy grading system often indicate?

- A. Blood pressure level

- B. Cancer aggressiveness
- C. Oxygen level
- D. Kidney filtration rate

Answer: B

Explanation: Tumor grading estimates how abnormal and aggressive cancer cells appear.

50. Which biopsy is often performed for muscle disorders?

- A. Muscle biopsy
- B. Liver biopsy
- C. Skin biopsy
- D. Dental biopsy

Answer: A

Explanation: Muscle biopsies help diagnose muscular diseases and inflammation.

51. What is the role of immunohistochemistry in biopsy analysis?

- A. Measuring blood sugar
- B. Identifying specific proteins in cells
- C. Repairing damaged tissue
- D. Removing tumors

Answer: B

Explanation: Immunohistochemistry uses antibodies to detect proteins that aid diagnosis.

52. Which biopsy can diagnose cirrhosis?

- A. Liver biopsy
- B. Skin biopsy
- C. Eye biopsy
- D. Bone biopsy

Answer: A

Explanation: Liver biopsy can evaluate scarring and cirrhosis severity.

53. Which biopsy method is commonly used for thyroid nodules?

- A. Fine-needle aspiration
- B. Excisional biopsy
- C. Bone marrow biopsy
- D. Skin biopsy

Answer: A

Explanation: Thyroid nodules are often sampled using fine-needle aspiration.

54. Which factor can affect biopsy healing?

- A. Smoking
- B. Hair color
- C. Shoe size
- D. Eye color

Answer: A

Explanation: Smoking can impair wound healing and increase complications.

55. What is the purpose of molecular testing on biopsy tissue?

- A. To determine genetic changes
- B. To improve circulation
- C. To increase appetite
- D. To reduce swelling

Answer: A

Explanation: Molecular testing identifies mutations that may guide treatment.

56. Which biopsy is commonly used for bone lesions?

- A. Bone biopsy
- B. Skin biopsy
- C. Punch biopsy
- D. Endoscopic biopsy

Answer: A

Explanation: Bone biopsies help diagnose infections, tumors, or metabolic disorders.

57. What is a vacuum-assisted biopsy?

- A. A biopsy performed underwater
- B. A method using suction to collect tissue
- C. A laser-based biopsy
- D. A blood collection procedure

Answer: B

Explanation: Vacuum-assisted biopsies use suction to obtain larger tissue samples.

58. Which biopsy is frequently used in dermatology?

- A. Skin biopsy
- B. Liver biopsy
- C. Renal biopsy
- D. Bone marrow biopsy

Answer: A

Explanation: Dermatologists commonly perform skin biopsies to diagnose skin conditions.

59. What is informed consent in relation to a biopsy?

- A. A payment receipt
- B. Patient permission after understanding risks and benefits
- C. A surgical instrument
- D. A pathology report

Answer: B

Explanation: Patients must understand the procedure and agree before undergoing a biopsy.

60. Which biopsy can help diagnose inflammatory bowel disease?

- A. Colon biopsy
- B. Bone biopsy
- C. Muscle biopsy
- D. Skin biopsy

Answer: A

Explanation: Colon biopsies can identify inflammation associated with Crohn's disease or ulcerative colitis.

61. Which laboratory process embeds tissue in wax for slicing?

- A. Tissue processing
- B. Electrolysis
- C. Dialysis
- D. Ventilation

Answer: A

Explanation: Tissue processing prepares biopsy samples for thin microscopic sections.

62. Which biopsy result term means "no evidence of cancer" ?

- A. Positive

- B. Malignant
- C. Negative
- D. Metastatic

Answer: C

Explanation: A negative biopsy means cancer was not detected in the sample.

63. Which biopsy is performed using a bronchoscope?

- A. Lung biopsy
- B. Skin biopsy
- C. Bone biopsy
- D. Muscle biopsy

Answer: A

Explanation: Bronchoscopic procedures obtain lung and airway tissue samples.

64. What is metastasis?

- A. Tissue healing
- B. Spread of cancer to other body parts
- C. Increased blood pressure
- D. Muscle growth

Answer: B

Explanation: Metastasis occurs when cancer spreads beyond its original location.

65. Which biopsy often requires fasting beforehand?

- A. Some abdominal biopsies
- B. Skin biopsies only
- C. Hair biopsies
- D. Nail biopsies

Answer: A

Explanation: Fasting may be required if sedation or abdominal procedures are planned.

66. What is a common purpose of a lymph node biopsy?

- A. Diagnosing infection or cancer spread
- B. Improving circulation
- C. Treating headaches
- D. Lowering blood sugar

Answer: A

Explanation: Lymph node biopsies can detect lymphoma, infection, or metastasis.

67. Which biopsy may be guided by mammography?

- A. Stereotactic breast biopsy
- B. Muscle biopsy
- C. Bone biopsy
- D. Liver biopsy

Answer: A

Explanation: Mammography guidance helps locate suspicious breast calcifications.

68. Why are biopsy samples sliced into thin sections?

- A. To reduce pain
- B. To allow microscopic examination
- C. To improve blood flow
- D. To strengthen tissue

Answer: B

Explanation: Thin sections allow light to pass through tissue for microscopic analysis.

69. Which biopsy may diagnose celiac disease?

- A. Small intestine biopsy
- B. Muscle biopsy
- C. Bone biopsy
- D. Skin biopsy

Answer: A

Explanation: Small bowel biopsies can reveal intestinal damage caused by celiac disease.

70. Which biopsy uses a rotating cutting needle?

- A. Core needle biopsy
- B. Shave biopsy
- C. Skin scraping
- D. Open biopsy

Answer: A

Explanation: Core needle devices often use spring-loaded cutting mechanisms.

71. What is the main advantage of minimally invasive biopsies?

- A. Longer recovery
- B. Reduced trauma and faster healing
- C. Greater scarring
- D. Increased hospitalization

Answer: B

Explanation: Minimally invasive techniques usually result in less pain and quicker recovery.

72. Which biopsy may require stitches?

- A. Excisional biopsy
- B. Fine-needle aspiration
- C. Cytology brushing
- D. Blood draw

Answer: A

Explanation: Surgical biopsies often require sutures to close the incision.

73. What does "precancerous" mean?

- A. Tissue likely to become cancerous
- B. Tissue already metastatic
- C. Completely normal tissue
- D. Tissue free of abnormalities

Answer: A

Explanation: Precancerous cells are abnormal and may develop into cancer over time.

74. Which biopsy is commonly performed in outpatient settings?

- A. Needle biopsy
- B. Major organ transplant
- C. Open-heart surgery
- D. Neurosurgery

Answer: A

Explanation: Many needle biopsies can be safely performed without hospitalization.

75. Which professional usually performs image-guided biopsies?

- A. Radiologist

- B. Dentist
- C. Pharmacist
- D. Nutritionist

Answer: A

Explanation: Radiologists frequently perform biopsies using imaging guidance.

76. What is one purpose of a repeat biopsy?

- A. To confirm or reassess disease
- B. To change eye color
- C. To strengthen bones
- D. To improve memory

Answer: A

Explanation: Repeat biopsies may be necessary if disease changes or initial results are unclear.

77. Which biopsy may be performed during colonoscopy?

- A. Colon biopsy
- B. Bone biopsy
- C. Liver biopsy
- D. Skin biopsy

Answer: A

Explanation: Colonoscopy allows physicians to collect tissue samples from the colon.

78. Which factor increases bleeding risk after biopsy?

- A. Anticoagulant medication
- B. Drinking water
- C. Wearing glasses
- D. Sleeping early

Answer: A

Explanation: Blood-thinning medications can increase post-procedure bleeding.

79. What is the purpose of a pathology report?

- A. To prescribe eyeglasses
- B. To describe biopsy findings and diagnosis
- C. To measure height
- D. To monitor exercise habits

Answer: B

Explanation: Pathology reports provide detailed microscopic findings and diagnoses.

80. Which biopsy may diagnose lymphoma?

- A. Lymph node biopsy
- B. Hair biopsy
- C. Dental biopsy
- D. Nail biopsy

Answer: A

Explanation: Lymph node tissue analysis helps diagnose lymphoma.

81. Which biopsy often uses ultrasound guidance in pregnancy-safe situations?

- A. Thyroid biopsy
- B. Eye biopsy
- C. Nail biopsy
- D. Hair biopsy

Answer: A

Explanation: Ultrasound-guided thyroid biopsy avoids ionizing radiation.

82. What is necrosis in biopsy terminology?

- A. Healthy tissue growth
- B. Tissue death
- C. Increased circulation
- D. Muscle strengthening

Answer: B

Explanation: Necrosis refers to dead tissue often caused by injury or disease.

83. Which biopsy may help diagnose myocarditis?

- A. Endomyocardial biopsy
- B. Skin biopsy
- C. Bone biopsy
- D. Dental biopsy

Answer: A

Explanation: Endomyocardial biopsies sample heart tissue to evaluate inflammation.

84. Which type of anesthesia may be used for large surgical biopsies?

- A. General anesthesia
- B. No anesthesia
- C. Eye drops only
- D. Topical shampoo

Answer: A

Explanation: Larger or more invasive biopsies may require general anesthesia.

85. What does dysplasia mean?

- A. Normal tissue structure
- B. Abnormal cell growth
- C. Complete tissue death
- D. Bone fracture

Answer: B

Explanation: Dysplasia describes abnormal cell development that may be precancerous.

86. Which biopsy can diagnose transplant rejection?

- A. Organ biopsy
- B. Skin biopsy only
- C. Hair biopsy
- D. Dental biopsy

Answer: A

Explanation: Tissue samples from transplanted organs can reveal rejection signs.

87. Which biopsy is often used to evaluate unexplained anemia?

- A. Bone marrow biopsy
- B. Skin biopsy
- C. Eye biopsy
- D. Liver biopsy

Answer: A

Explanation: Bone marrow biopsies can identify blood cell production disorders.

88. What is one advantage of ultrasound-guided biopsy?

- A. Real-time imaging
- B. Increased radiation exposure
- C. Longer recovery time
- D. Permanent sedation

Answer: A

Explanation: Ultrasound provides real-time visualization during needle placement.

89. Which biopsy commonly diagnoses oral cancer?

- A. Oral tissue biopsy
- B. Bone biopsy
- C. Renal biopsy
- D. Muscle biopsy

Answer: A

Explanation: Oral biopsies examine suspicious lesions inside the mouth.

90. What is fibrosis in biopsy findings?

- A. Scar tissue formation
- B. Bone loss
- C. Blood infection
- D. Muscle spasm

Answer: A

Explanation: Fibrosis refers to excessive connective tissue or scarring.

91. Which biopsy may be performed with robotic assistance?

- A. Prostate biopsy
- B. Hair biopsy
- C. Nail biopsy

D. Skin scraping

Answer: A

Explanation: Robotic systems can assist with precision in some prostate biopsies.

92. What is a common emotional response before a biopsy?

- A. Anxiety
- B. Increased appetite only
- C. Memory enhancement
- D. Instant pain relief

Answer: A

Explanation: Many patients feel anxious before medical procedures and while awaiting results.

93. Which biopsy may help diagnose chronic kidney disease?

- A. Kidney biopsy
- B. Eye biopsy
- C. Skin biopsy
- D. Muscle biopsy

Answer: A

Explanation: Kidney tissue examination can identify causes of kidney damage.

94. Which term refers to examining cells rather than tissue structure?

- A. Cytology
- B. Histology
- C. Pathogenesis
- D. Hematology

Answer: A

Explanation: Cytology focuses on individual cells rather than tissue architecture.

95. What should patients usually avoid immediately after certain biopsies?

- A. Strenuous activity
- B. Drinking water
- C. Resting
- D. Eating healthy foods

Answer: A

Explanation: Heavy physical activity may increase bleeding risk after some biopsies.

96. Which biopsy may be performed laparoscopically?

- A. Abdominal biopsy
- B. Hair biopsy
- C. Nail biopsy
- D. Eye biopsy

Answer: A

Explanation: Laparoscopy allows minimally invasive access to abdominal organs.

97. What is one reason for false-negative biopsy results?

- A. Missing the abnormal area
- B. Excess hydration
- C. Wearing jewelry
- D. High vitamin intake

Answer: A

Explanation: If abnormal tissue is not sampled, disease may go undetected.

98. Which biopsy may evaluate nerve disorders?

- A. Nerve biopsy
- B. Hair biopsy
- C. Skin scraping
- D. Nail biopsy

Answer: A

Explanation: Nerve biopsies help diagnose neuropathies and nerve inflammation.

99. What is one benefit of early biopsy diagnosis?

- A. Delayed treatment
- B. Earlier treatment planning
- C. Guaranteed cure
- D. Elimination of all follow-up

Answer: B

Explanation: Early diagnosis can improve treatment options and outcomes.

100. Why are biopsies considered important in modern medicine?

- A. They replace all imaging tests
- B. They provide direct tissue diagnosis
- C. They eliminate the need for doctors
- D. They cure all diseases

Answer: B

Explanation: Biopsies provide definitive information about tissue abnormalities and are essential for accurate diagnosis and treatment planning.