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Minimally Invasive Biopsy Techniques Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product Offered (Tests, Kits & Consumables, Instruments), By Technique (Liquid Biopsy, Optical Biopsy, Brush Biopsy, Pigmented Lesion Assays, Others {Breath Biopsy etc.}), By Circulating Biomarker (Circulating Tumor Cells (CTCs), Cell Free DNA (cfDNA), Circulating Tumor DNA (ctDNA), Extracellular Vesicles, Others {miRNA, CTECs, circRNA etc.}), By Application (Clinical and Therapeutic), By End User (Hospitals & Clinics, Ambulatory Care Center, Academic & Research Institutions), By Region, By Competition, 2019-2029F

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Abstracts

Global Minimally Invasive Biopsy Techniques Market was valued at USD 12.47 Billion in 2023 and is anticipated to project impressive growth in the forecast period with a CAGR of 10.22% through 2029. Compared to traditional open diagnostic surgery, minimally invasive biopsy offers a significant reduction in the need for multiple surgical interventions. In cases where individuals present with suspected or ambiguous breast lesions identifiable through imaging, minimally invasive biopsy has supplanted open excisional biopsy procedures. Furthermore, when contrasted with surgical excision, Minimally Invasive Biopsy (MIB) demonstrates comparable or enhanced precision levels, thereby alleviating psychological burdens on patients and offering cost savings. In the context of impalpable cancers such as breast cancer, MIB reduces the necessity

for extensive surgical procedures. Its minimally invasive nature facilitates the detection of cancer, aiding in treatment monitoring and selection. Additionally, compared to surgical biopsy techniques, minimally invasive biopsy can be performed multiple times, enhancing procedural ease and enabling the detection of various cancer types.

Key Market Drivers

Rise in Cancer Cases Due to Multiple Factors

In many nations characterized by a low to medium Human Development Index (HDI), profound shifts in lifestyle, socio-cultural dynamics, and environmental conditions significantly influence the prevalence of cancer risk factors. Among these factors, delayed childbearing, decreased fertility rates, elevated obesity levels, and sedentary lifestyles stand out as notable contributors to the rising incidence of breast cancer. This global trend of increasing breast cancer cases underscores the critical need for proactive intervention.Lifestyle choices, including tobacco use, obesity, and alcohol consumption, play a pivotal role in the higher cancer incidence observed in high-income countries with advanced healthcare systems. These nations boast superior capacities for early cancer detection and effective treatment, underscoring the intricate interplay between socio-economic factors and healthcare outcomes.Despite remarkable advancements in medical science and technology, which have led to improved cancer survival rates worldwide, the absolute number of cancer-related deaths continues to escalate. This paradoxical trend is partly attributable to the rapidly aging global population, which inherently heightens the overall risk of cancer development and progression.When assessing cancer incidence rates, it's essential to consider variations in population age distributions among different nations. Consequently, efforts aimed at early diagnosis and prevention strategies are paramount in mitigating mortality rates associated with cancer. Central to these efforts is the promotion of awareness and advocacy for the widespread adoption of minimally invasive biopsy techniques, representing a cornerstone in the arsenal against cancer. Through these concerted endeavors, we can strive to curtail the devastating impact of cancer on global health outcomes.

Integration of Artificial Intelligence Will Support the Market Growth

One of the prominent trends shaping the minimally invasive biopsy technology market is the increasing adoption of robotics in biopsy procedures. Robotic-assisted surgery has notably enhanced surgical precision and provided surgeons with improved visibility at

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the operative site. These robotic devices offer enhanced control and a broader range of motion compared to traditional open surgeries, resulting in their growing utilization.

Another significant development is the integration of molecular imaging technology with Artificial Intelligence (AI), which holds immense promise for advancing the diagnosis of colorectal cancer. AI algorithms empower clinicians to compare a patient's data with extensive databases of treated patients, aiding in treatment selection and outcome prediction. In the realm of colorectal cancer diagnosis, capsule endoscopy (CE) emerges as a potent alternative strategy. Historically, colon CE has been a labor-intensive process reliant on human interpretation of captured images to detect potential colorectal cancer lesions. By providing a non-invasive means to assess the small intestine, CE fills a critical gap left by traditional endoscopic methods.

Furthermore, AI-driven advancements are evident in the realm of liquid biopsies, where the complexity and volume of generated data pose challenges for traditional processing methods. Machine learning techniques, such as support vector machines (SVM), random forest (RF), and artificial neural networks (ANNs), offer promising avenues for automated data analysis and future predictive modeling in this domain. These techniques have demonstrated successful applications across various sectors of the medical industry, signaling their potential in revolutionizing liquid biopsy analysis.

Initiatives at Global Levelto Support Market Growth

The World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) have joined forces with other United Nations (UN) entities to strengthen global political commitment to cancer prevention and control. This collaboration is geared towards conducting research on the causes of human cancer and the mechanisms of carcinogenesis. Additionally, it involves engaging with other UN bodies, such as the International Atomic Energy Agency, to monitor cancer prevalence as part of the activities under the Global Initiative on Cancer Registries, particularly in countries where data availability is limited.Furthermore, the initiative aims to identify 'best buys' and other high-priority, cost-effective measures for cancer prevention and control. This includes promoting the adoption of minimally invasive biopsy techniques. Moreover, WHO and IARC are providing guidelines and standards to steer the development and implementation of comprehensive programs for cancer prevention, early detection, screening, treatment, palliative care, and survivorship care for both adults and children.In addition to these efforts, the initiative focuses on raising awareness about the benefits of minimally invasive biopsy techniques. By doing so, it seeks to improve access to cancer treatments by strengthening local and national healthcare systems.

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Through these multifaceted approaches, WHO and IARC aim to make significant strides in the global fight against cancer.

Increasing Proliferation of the Minimally Invasive Surgical Procedure

Core needle biopsy and fine needle aspiration biopsy represent two widely used minimally invasive biopsy techniques in breast biopsy procedures, offering numerous advantages over surgical biopsy. These methods are characterized by lower costs, minimal scarring, comparable diagnostic accuracy, and the absence of the need for general anesthesia or sedation.In regions with limited resources, where patients often present with advanced-stage breast cancer, the adoption of minimally invasive biopsy techniques facilitates prompt and accurate diagnosis while remaining cost-effective. The successful implementation of a minimally invasive breast biopsy program hinges upon several key factors. These include raising public awareness about the less invasive nature of these procedures, which can incentivize women to seek early medical attention. Additionally, a shift in medical professionals' treatment philosophies towards prioritizing patient involvement in decision-making and embracing less invasive yet reliable diagnostic techniques is crucial for the program's effectiveness.

Key Market Challenges

Technical Complexity Learning Curve

Minimally invasive biopsy techniques represent a significant challenge for healthcare professionals due to their specialized skill requirements and technical complexity. These procedures, including endoscopic biopsies, fine-needle aspirations, and core needle biopsies, demand a high level of precision and proficiency to ensure accurate sample collection while minimizing patient discomfort and complications. However, mastering these techniques necessitates extensive training and hands-on experience, contributing to a steep learning curve for healthcare practitioners. Moreover, the intricate nature of some minimally invasive biopsy procedures increases the risk of procedural errors or suboptimal sample quality, which can adversely affect diagnostic accuracy and patient outcomes. To overcome this challenge, comprehensive training programs, continuous medical education, and standardized protocols are essential to enhance the proficiency and confidence of healthcare professionals in performing minimally invasive biopsy techniques. By providing healthcare practitioners with the necessary knowledge, skills, and resources, these initiatives can mitigate the technical challenges associated with minimally invasive biopsy procedures, ultimately improving patient care and diagnostic accuracy.

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Sampling Adequacy and Diagnostic Accuracy

Ensuring the adequacy and accuracy of biopsy samples obtained through minimally invasive techniques is critical for reliable diagnostic results and optimal patient care. However, sampling adequacy can be challenging, particularly in cases involving small or deep-seated lesions, where accessing the target tissue may be difficult or limited. Inadequate tissue sampling can lead to false-negative results, delaying diagnosis, and potentially compromising patient management. Additionally, variations in tissue processing, specimen handling, and pathological interpretation may further impact diagnostic accuracy. Overcoming this challenge requires advanced imaging technologies, such as ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI), to precisely target lesions and guide biopsy needle placement. Moreover, implementing quality assurance measures, including standardized biopsy protocols and multidisciplinary collaboration between clinicians, radiologists, and pathologists, is essential to optimize sampling adequacy and diagnostic accuracy in minimally invasive biopsy procedures.

Key Market Trends

Shift Towards Interventional Radiology

The Global Minimally Invasive Biopsy Techniques Market is witnessing a notable shift towards interventional radiology as the preferred approach for conducting biopsy procedures. Interventional radiology techniques, encompassing image-guided biopsies utilizing ultrasound, CT, or MRI, present several advantages over traditional surgical biopsies. Notably, these techniques offer real-time visualization of the biopsy site, enabling precise needle placement and minimizing the risk of procedural complications. Moreover, interventional radiology procedures are often performed on an outpatient basis, leading to shorter hospital stays, expedited recovery times, and reduced healthcare costs for patients. The escalating adoption of interventional radiology techniques underscores the growing significance of minimally invasive modalities in contemporary healthcare practices and contributes significantly to the expansion of the Global Minimally Invasive Biopsy Techniques Market.

Emphasis on Personalized Medicine

Personalized medicine stands out as a significant trend catalyzing innovation within the Global Minimally Invasive Biopsy Techniques Market. With a focus on tailoring medical

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interventions to the individual patient's genetic profile, lifestyle factors, and specific disease characteristics, personalized medicine represents a paradigm shift in healthcare delivery. Minimally invasive biopsy techniques serve as a cornerstone in realizing the objectives of personalized medicine by furnishing clinicians with in-depth molecular insights into a patient's ailment. This wealth of molecular data facilitates precise disease diagnosis, enables the selection of targeted therapies, and facilitates the monitoring of treatment response over time. Leveraging minimally invasive biopsy techniques empowers healthcare providers to administer therapies that are not only more effective but also minimize adverse side effects, ultimately enhancing patient outcomes. As personalized medicine principles continue to permeate clinical practice, the adoption of minimally invasive biopsy techniques is anticipated to surge, propelling market growth in the foreseeable future.

Segmental Insights

Product Offered Insights

Based on the product offered, kits consumables emerge as the dominant segment. These kits and consumables encompass a wide array of essential components required for conducting minimally invasive biopsy procedures effectively and efficiently. This category includes biopsy needles, catheters, guidewires, specimen containers, and various ancillary supplies essential for sample collection, processing, and analysis. As minimally invasive biopsy techniques gain prominence across diverse medical specialties, the demand for specialized kits and consumables continues to escalate.

Healthcare facilities and practitioners rely heavily on these kits and consumables to perform biopsy procedures with precision, accuracy, and minimal invasiveness, thereby enhancing patient comfort and safety. Moreover, the availability of advanced biopsy kits equipped with cutting-edge features such as real-time imaging guidance, ergonomic designs, and compatibility with various imaging modalities further bolsters their appeal among healthcare providers.

The burgeoning adoption of liquid biopsy techniques, which require specialized collection tubes, reagents, and assay kits for analysing circulating biomarkers, contributes significantly to the dominance of kits and consumables in the market. The continuous advancements in materials science, manufacturing technologies, and product designs within the kits and consumables segment enhance their performance, reliability, and user-friendliness, driving their widespread adoption and market dominance. Although instruments such as imaging systems and biopsy guns play a

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crucial role in facilitating minimally invasive biopsy procedures, it is the kits and consumables segment that serves as the backbone of these procedures, underscoring its dominant position in the Global Minimally Invasive Biopsy Techniques market.

Technique Insights

Based on the technique segment, Liquid Biopsy emerges as the dominant approach. Liquid biopsy techniques involve the analysis of circulating biomarkers, such as circulating tumor DNA (ctDNA), circulating tumor cells (CTCs), and exosomes, present in bodily fluids like blood, urine, and cerebrospinal fluid. This non-invasive method offers several advantages over traditional tissue biopsies, including reduced patient discomfort, minimal risk of complications, and the ability to capture real-time molecular information about the disease. Liquid biopsy techniques are particularly valuable in oncology for detecting cancer-related biomarkers and monitoring treatment response. The versatility of liquid biopsy extends beyond oncology to other disease areas, including infectious diseases, autoimmune disorders, and prenatal screening. The increasing adoption of liquid biopsy techniques underscores their significance in modern healthcare practices and their dominant position in the Global Minimally Invasive Biopsy Techniques Market.

Regional Insights

North America asserts its dominance within the global Minimally Invasive Biopsy Techniques Market due to a confluence of compelling factors. Foremost, the region boasts an advanced healthcare infrastructure characterized by a proliferation of cutting-edge medical facilities. These establishments are equipped with state-of-the-art imaging modalities and interventional radiology suites, empowering healthcare professionals to conduct minimally invasive biopsy procedures with unparalleled precision and accuracy. Furthermore, North America exhibits a remarkable commitment to technological innovation, continually pushing the boundaries of medical science. This culture of innovation fosters the development and adoption of groundbreaking minimally invasive techniques, further solidifying the region's leadership position.

North America benefits from favorable reimbursement policies that incentivize the utilization of minimally invasive biopsy procedures, ensuring widespread access to these advanced medical technologies. This supportive reimbursement environment not only enhances patient care but also fuels market growth within the region. Additionally, the robust research and development landscape in North America plays a pivotal role in driving innovation and advancing the field of minimally invasive biopsy techniques.

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Academic institutions, alongside key market players, are actively engaged in pioneering research endeavors, leading to the continuous evolution and refinement of these cutting-edge technologies.

Key Market Players

F. Hoffmann-La Roche AG

Thermo Fisher Scientific, Inc.

PerkinElmer Inc.

QIAGEN NV

Guardant Health, Inc.

Veracyte, Inc.

Myriad Genetics, Inc.

Biocept, Inc.

NeoGenomics Laboratories, Inc.

Adaptive Biotechnologies Corporation

Report Scope:

In this report, the Global Minimally Invasive Biopsy Techniques Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Minimally Invasive Biopsy Techniques Market,By Product Offered:

oTests

oKits Consumables

oInstruments

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Minimally Invasive Biopsy Techniques Market, By Technique:

oLiquid Biopsy

oOptical Biopsy

oBrush Biopsy

oPigmented Lesion Assays

oOthers (Breath Biopsy etc.)

Minimally Invasive Biopsy Techniques Market, By Circulating Biomarker:

oCirculating Tumor Cells (CTCs)

oCell Free DNA (cfDNA)

oCirculating Tumor DNA (ctDNA)

oExtracellular Vesicles

oOthers (miRNA, CTECs, circRNA etc.)

Minimally Invasive Biopsy Techniques Market, By Application:

oClinical

·Treatment Monitoring

·Prognosis Recurrence Monitoring

·Treatment Selection

·Others (Diagnosis and Screening etc.)

oTherapeutic

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·Breast Cancer

·Lung Cancer

·Prostate Cancer

·Colorectal Cancer

·Others (Blood Cancer, Thyroid Cancer etc.)

Minimally Invasive Biopsy Techniques Market, By End User:

oHospitals Clinics

oAmbulatory Care Centers

oAcademic Research Institutions

Minimally Invasive Biopsy Techniques Market, By Region:

oNorth America

United States

Canada

Mexico

oEurope

France

United Kingdom

Italy

Germany

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Spain

oAsia-Pacific

China

India

Japan

Australia

South Korea

oSouth America

Brazil

Argentina

Colombia

oMiddle East Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Minimally Invasive Biopsy Techniques Market.

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Available Customizations:

Global Minimally Invasive Biopsy Techniques market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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