Pharmaceutical Industry

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**Introduction to Pharmaceuticals Industry**

Pharmaceutical industry is in general about discovery, development, and manufacture of drugs and medications by public and private organizations. The modern era of the pharmaceutical industry—of isolation and purification of compounds, chemical synthesis, and computer-aided drug design—is considered to have begun in the 19th century, thousands of years after intuition and trial and error led humans to believe that plants, animals, and minerals contained medicinal properties. The unification of research in the 20th century in fields such as chemistry and physiology increased the understanding of basic drug-discovery processes. Identifying new drug targets, attaining regulatory approval from government agencies, and refining techniques in drug discovery and development are among the challenges that face the pharmaceutical industry today. The continual evolution and advancement of the pharmaceutical industry is fundamental in the control and elimination of disease around the world.

**Industry Stakeholders**

1. **Patients, Caregivers and Patient Organizations:** They help industry leaders to understand what it is like to live with a disease, the challenges facing patients and their families, and the role that diagnostics and treatments play in managing disease. Guide industry people in developing new products and in co-developing education and training materials. Provide insights into how to assist healthcare professionals to support them.
2. **Manufacturers:** A pharmaceutical company, or drug company, is a commercial business licensed to research, develop, market and/or distribute drugs, most commonly in the context of healthcare. They can deal in generic and/or brand medications. They are subject to a variety of laws and regulations regarding the patenting, testing and marketing of drugs, particularly prescription drugs.
3. **Physicians & Health Care Professionals:** Improve each other’s understanding of new and emerging clinical data, and advances in treatment and diagnosis. Provide information and training for HCPs on treatment options, safety concerns, correct product use, quality control and other areas. Help produce educational material on diseases, treatment options, safety concerns and correct product use.
4. **Governments, Public and Private Payers, and Health Technology Associations (HTAs):** Co-develop methods for evaluating the medical value and benefit of new medicines and diagnostics. Negotiate commercial arrangements that improve access to products. Co-develop flexible pricing models to address affordability across the different regions. Jointly develop tailored programs with governments to strengthen healthcare infrastructure.
5. **Non-profit Organizations (NGOs):** Work with funding agencies, charities, foundations and other non-profit organizations to develop programs aimed at strengthening local healthcare systems and addressing funding challenges.
6. **Suppliers and other business partners:** Work closely with business partners along the value chain to manage business and operational risks and opportunities and create maximum joint value, Work with key suppliers to improve their sustainability performance and to meet standards set out in Supplier Code of Conduct. Partner with manufacturers in various countries to improve local capabilities, skills and employment.
7. **Scientific Communities, Biotech companies and Academia:** Complement internal R&D with external network of partners to increase diversity, flexibility and breadth of research
8. **Media:** For informing the public and other audiences of market leading company’s mission, policies, practices and products in a positive, consistent and credible manner. Regular interactions with lay, business and trade journalists to explain industry perspective on key topics, such as access to healthcare, pricing, biosimilars, clinical trial data sharing.
9. **Pharmacy Benefit Manager:** PBMs are the connectors between employers, members, drug wholesalers, pharmacies, and drug companies working to facilitate the best possible health outcomes at the best possible costs. They reduce the amount spend by negotiating with drug manufacturers, distributors, clinical programs etc. They also are responsible for increasing the access to medication.
10. **Distributors:** Primary pharmaceutical distributors purchase prescription medicines and other medical products directly from manufacturers for storage in warehouses and distribution centers across the country. Healthcare providers place orders with distributors for the medicines and products they need, and the distributors process and deliver the orders daily. Without primary distributors acting as a vital link between manufacturers and healthcare providers to help ensure patients get the needed medicine.
11. **Payers:** Payers in theory are responsible to ensure that limited financial resources are used appropriately to create quality of services, broad access to needed services, patient safety, and affordable healthcare coverage. To accomplish this goal, payers and other managers of healthcare populations must have accurate, reliable data. Payers also are charged to ensure that payment is fair, and commensurate with the severity and complexity of each service.

**Major Players of the Pharmaceutical Industry**

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| Companies | Divisions | Revenue (2017) |
| Johnson & Johnson | Medical Devices,  Consumer Health Care products and  Pharmaceuticals | $76.5 B |
| Pfizer | Innovative Medicines, Consumer Health Products and Established Medicine Division. | $ 51.7 B |
| Novartis | pharmaceuticals, eye care and generic medicines | $ 48.9 B |
| Merck | Performance Chemicals and Pharmaceuticals | $ 40.7 B |
| Glaxo Smith Kline | Innovative pharmaceutical medicines, vaccines and consumer healthcare products. | $ 37.6 B |

**Emerging companies in the industry**

Some of the biggest innovations in the [healthcare](https://www.thebalance.com/healthcare-costs-3306068) industry is being made by small pharmaceutical companies, some with fewer employees than a single department in one of the larger companies. By focusing on niche markets and therapeutic areas, these little companies are making a big impact on patients.  Several companies – mainly information technology enterprises – engaged in supporting pharmaceutical development and sales.

1. **US WorldMeds**: Its marketed products include treatments for malignant hyperthermia, cervical dystonia, and hypomobility in Parkinson's disease. It also makes Lofexidine, a non-narcotic drug for reducing opiate withdrawal symptoms, a growing area of concern as opiates continue to be abused.
2. **Elorac Inc.:** It develops and markets drug products for the U.S. dermatology and oncology drug markets. It makes drugs used to treat and remove the removal of common and plantar warts.
3. **Pacira Pharmaceuticals, Inc.:** It is developing non-opioid products for managing post-surgical pain. It also developed a novel drug delivery method which encapsulates drugs and then releases them over a set time ranging from 1 to 30 days.
4. **Putney**: It creates high-quality generic medications for pets. From pain relief medications to antibiotics, they produce drugs used in veterinarians' offices around the country. Its products are used for skin infections in dogs and Carprofen, used to treat canine osteoarthritis and given for some post-surgery pain.
5. [**Vets First Choice**](http://www.vetsfirstchoice.com/)**:** It is an online veterinary partner-pharmacy and marketing service provider that provides home delivery of FDA-approved pharmaceuticals, therapeutic diets and compounded medications to pet owners on behalf of veterinary practices.
6. **Clinipace Worldwide** is a [contract research organization (CRO)](https://www.thebalance.com/what-is-a-biosimilar-drug-4042688) that conduct trials of experimental drugs for pharmaceutical and [biotechnology](https://www.thebalance.com/biotech-4074047) companies.
7. **Integrated Prescription** **Management** is a prescription benefit manager. It provides services for employers, third-party administrators, and brokers.
8. **Noble Rx Marketing** develops educational marketing materials geared toward patients and healthcare professionals on behalf of biotech and pharmaceutical companies. They create a wide variety of comprehensive materials from disease state information to guides on how to use and administer treatment, used by both physicians and their patients.
9. **Greenphire,** develops and manages proprietary payment technologies for the clinical trial industry. An extremely competitive area, clinical trials are the focal point for many pharmaceutical companies, making Greenphire highly sought after.

**Major Industry Trends**

1. **Drug-pricing concerns will only intensify:**  Big pharma players (e.g., Allergan, GSK, Novo Nordisk, Eli Lilly) are already saying ‘enough is enough’ and committing to voluntary price restraints or greater emphasis on volume-driven sales. Others, such as Novartis, Amgen and Roche, are coming out in favor of value-based pricing.
2. **The healthcare and technology sectors will continue to converge:** Among the markers of this convergence is the explosion in healthcare apps and other digital innovations, geared to boosting connectivity and engagement between all players along the healthcare chain.
3. **Adoption of Artificial Intelligence (AI) by pharma and biotech:** A potential of AI-based tools is now explored at all stages of drug discovery and development -- from research data mining and assisting in target identification and validation, to helping come up with novel lead compounds and drug candidates, and predicting their properties and risks. And finally, AI-based software is now able to assist in planning chemical synthesis to obtain compounds of interest. AI is also applied to planning pre-clinical and clinical trials and analyzing biomedical and clinical data.
4. **Organs (body)-on-a-chip:** Microchips lined by living human cells could revolutionize drug development, disease modeling and personalized medicine. These microchips, called ‘organs-on-chips’, offer a potential alternative to traditional animal testing. Ultimately, connecting the systems altogether is a way to have the whole “body-on-a-chip” system ideal for drug discovery and drug candidate testing and validation.
5. **Bioprinting:** The area of bioprinting human tissues and organs is rapidly developing and it is, undoubtedly, the future of medicine. Founded in early 2016, Cellink is one of the first companies in the world to offer 3D printable bioink – a liquid that enables life and growth of human cells. Now the company bioprints parts of the body -- noses and ears, mainly for testing drugs and cosmetics. It also prints cubes enabling researchers to “play” with cells from human organs such as livers.

**Industry Challenges**

1. Trump’s administration wants to lower the drug prices and have a comprehensive health care system in US. This can have huge impact on the stakeholders.
2. Company adapting to new strategies and innovation is slowing down.
3. Smaller companies are eating up market share of big players - E.g. – Pfizer’s Lyrica – 5.1 billion USD. They are making versions of their own of the drug. They can dethrone Lyrica.
4. Cyber security stealing data from pharma companies to get insider data and to make illegal stock trade.
5. Global anti-corruption. SEC & DOG – pharma as primary violators of the FCPA. FCPA prohibits giving anything of value to foreign official for obtaining business.

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