Rajiv Gandhi National Institute of Intellectual Property Management

IP Management in Pharmaceutical Sector; an Insider's Perpectives

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Introduction to about IP Management

- Intellectual Property management is the strategic and systematic handling of intellectual property assets within an organization.
- Intellectual property includes creations of the mind, such as inventions, literary and artistic works, designs, symbols, names, and images used in commerce.
- Effective IP management aims to protect these assets, maximize their value, and ensure they contribute to an organization's competitiveness and innovation.

Types of Intellectual Property:

- Patents
- Copyrights
- Trademarks
- Designs
- Trade Secrets

Introduction to about IP Management

IP Management Stages:

- **Identification:** Recognize all forms of intellectual property within a business, whether created in-house or acquired from external sources.
- **Protection:** Implement measures to safeguard IP rights, such as filing for patents, registering copyrights and trademarks, and using non-disclosure agreements.
- **Commercialization:** Determine how to extract value from IP, whether through licensing, joint ventures, partnerships, or direct exploitation.
- **Enforcement:** Actively monitor and enforce IP rights to prevent infringement and unauthorized use by others.

Introduction to about IP Management

IP Lifecycle:

- **Phase 1:** Creation. The initial development of an innovative idea or invention that IP rights can protect.
- **Phase 2:** Protection. Application for legal protection (e.g., patent application, copyright registration) to secure exclusive rights.
- **Phase 3:** Commercialization. Exploration of various avenues to monetize IP, such as licensing, selling, or integrating it into products and services.
- **Phase 4:** Enforcement. Market monitoring for potential IP infringements and taking legal action if necessary.

Why IP is Important in Pharmaceutical Sector?

- Innovation drives the pharmaceutical industry.
- Innovation also differentiates research-based pharmaceutical companies from generic drug companies.
- Pharmaceutical companies heavily invest in lengthy and costly research and development processes to remain relevant in the market.
- The average time it takes for a new drug to come to the marketplace is at least ten years, with clinical trials alone taking about ten to twelve years.
- Furthermore, there is only a 12 percent success rate of bringing a drug through clinical trials.

Why IP is Important in Pharmaceutical Sector?

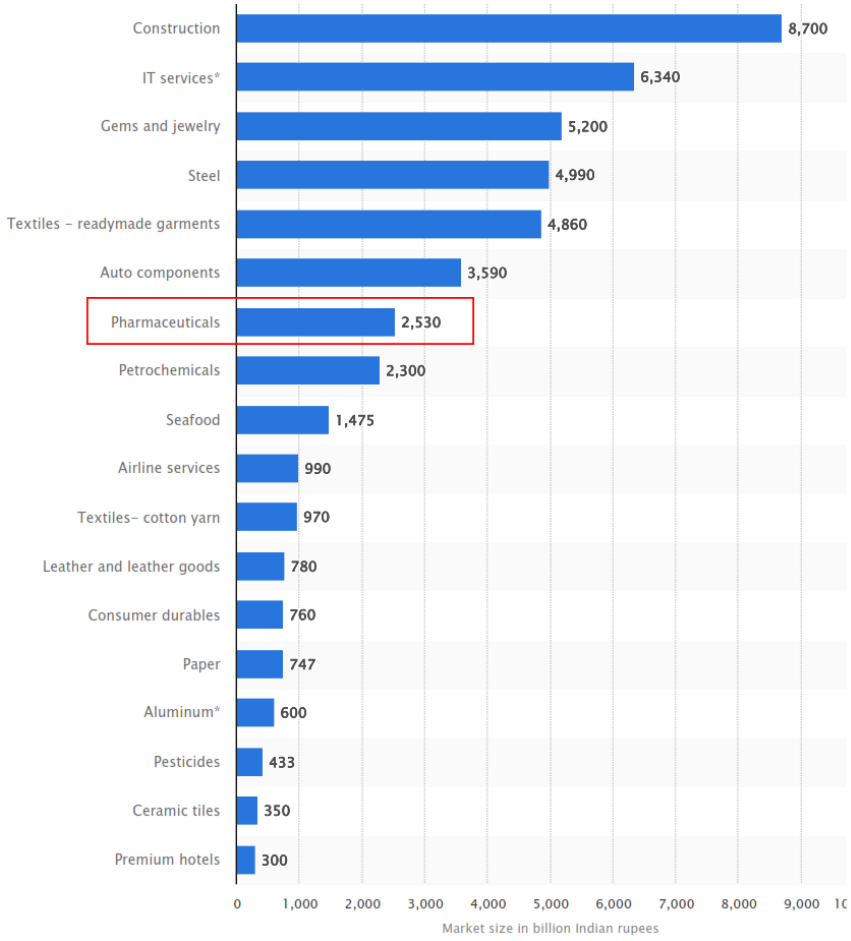
- A considerable number of drugs that move to clinical trials never receive government approval. Even if a new drug successfully completes all the necessary steps to get to market, pharmaceutical companies face heavy competition with other pharmaceutical companies. This pressure has led big pharmaceutical companies to spend far more on marketing than on research and development.
- For example, Johnson & Johnson spent more than twice the development costs on the marketing directed to physicians, who write prescriptions.
- Accordingly, companies in the pharmaceutical industry usually depend on a period of both (1) market exclusivity derived from patent protection, and; (2) data exclusivity in order to recoup their research and development costs.

Why IP is Important in Pharmaceutical Sector?

- Whenever any company starts new drug development program, it cost to company from $0.8 billion to $2.3 billion per new drug and average time from 10 to 12 years.
- Hence, the first propaganda for any pharmaceutical company when they start drug development is to have appropriate IP rights protection which will run through 20 years of time to recover all these investments.
- The IP rights depends on medical advancements and therapies in which companies are focusing on research & development (R&D) area such as-
  - Cancer
  - Cardiovascular diseases
  - Diabetes
  - HIV and AIDS
  - Immune-system diseases
  - Neurodegenerative diseases
  - Viral diseases

Why IP is Important in Pharmaceutical Sector?

- Pharmaceutical Industry is considered as world's top 5 largest sectors among all sectors.
- The pharma industry has witnessed phenomenal growth in the past two decades, with revenues totaling $1.27 trillion in 2022.
- India is the largest provider of generic drugs globally, meeting 50% of the global demand for various vaccines, 40% of the generic demand in the US, and 25% of all medicine in the UK.



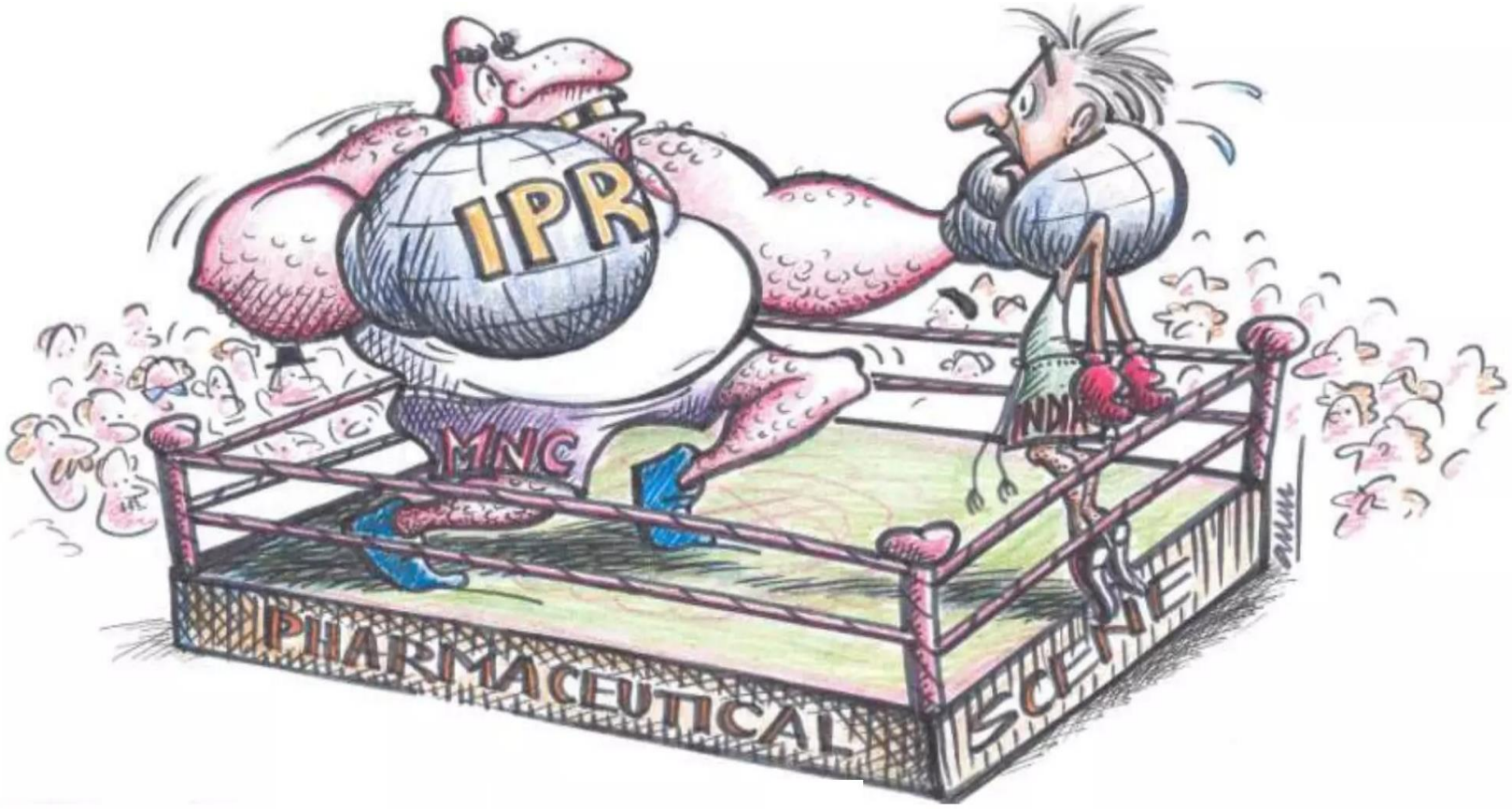
Why IP is Important in Pharmaceutical Sector?

- Without spending time and money to create new medications, generic drug manufacturers can copy biopharmaceutical advances with insufficient intellectual property rights protection.
- As a result, branded drug manufacturers find it challenging to spend on research and development (R&D) of new therapies and expensive diseases. This is because they cannot recoup investments in new drug development.
- A stronger IPR regime helps pharma businesses protect inventions from research to development.
- Intellectual property creation, management, and protection are increasingly significant funding sources for R&D investments.
- IPRs are independent commodities that may be exchanged through licensing, joint ventures, etc. They also play a significant part in the mergers and acquisitions of the target SME which helps companies in further drug development program.

Why IP is Important in Pharmaceutical Sector?

- IP generally understood to have two principal areas of impact in pharmaceuticals.
- First, there is the issue of pricing and access, where discussion focuses on the links between IPRs (particularly patent rights), exclusion of competitors and the availability and pricing of new medicines.
- Second, there is the issue of R&D incentives – that is to say, the role of IPRs in providing incentives to discover, develop and market new drugs – and the effect of IPRs on R&D expenditure and its allocation across diseases, countries and organizations.
- Obviously, these two issues are closely linked, and their interplay presents a series of very difficult economic issues and policy questions.

Why IP is Important in Pharmaceutical Sector?



Area's for Different Types of IP Protection in Pharmaceutical Sector

- Patents
- Designs
- Trademarks (Highly prevalent in India and certain other countries)
- Trade Secrets
- Copyrights (very rare)

Apart from the above, different other types of market exclusive rights are provided to pharmaceutical companies depending upon country such as –

- Patent Term Extension to compensate for regulatory review delay
- Market Exclusivity provided by regulatory approval
- Extensions for pediatric investigation
- Extensions for orphan drugs
- Extensions for drugs targeting specific diseases

Area's for Different Types of IP Protection in Pharmaceutical Sector

- Patents are granted for following different inventions in pharmaceutical area. Patents rights provide approx. 20 to 25 years of life cycle to brand companies before entry of first generic in the market.
  - For new drug molecules/products,
  - Manufacturing processes,
  - Manufacturing intermediates,
  - Alternative salts and esters of previously patented compound,
  - Use of a product in treating specific diseases,
  - Treatment protocols & Dosing,
  - Packaging/delivery mechanisms
  - Metabolites
  - Genomic or biophysical data
  - Physiological pathways & Targets/receptors
  - Transgenic organisms

Area's for Different Types of IP Protection in Pharmaceutical Sector

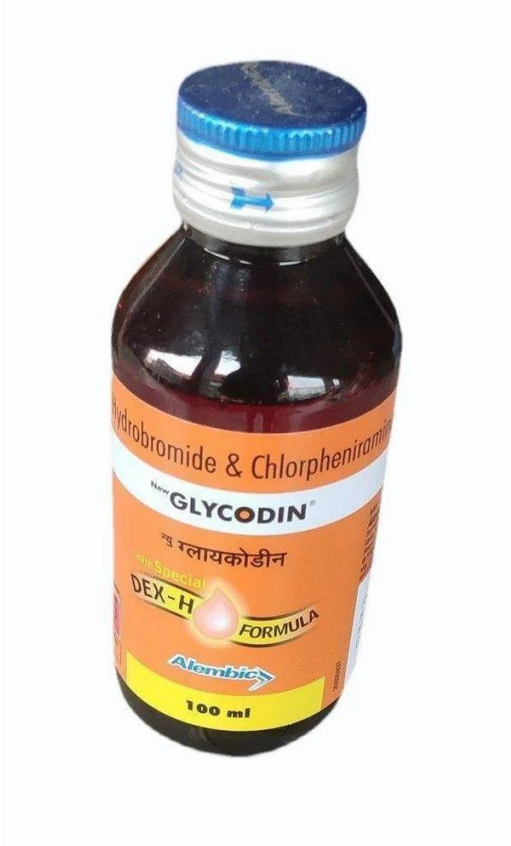
Trademarks:

- Protection of brand names
- Protection of trade dress

- Trademark is very prevalent in India in pharmaceutical business in comparison to patent because Indian pharmaceutical market is governed by brand name, hence from small manufacturer to large manufacturer, always take trademark protection in India to market brand effectively. Hence, pharmaceutical IP rights can be enjoyed by both brand companies (new drug molecule identifier) and generic companies (copy cat version of brand) in India.
- If we will see, other countries scenario then it is around other way. For examples, In US and European countries, patents preference is very high considering drug pricing, hence usually brand try to keep strong patent protection to prevent other generic company entry in the market. Once product gets off patent then no further IP rights because no brand side market advantage.

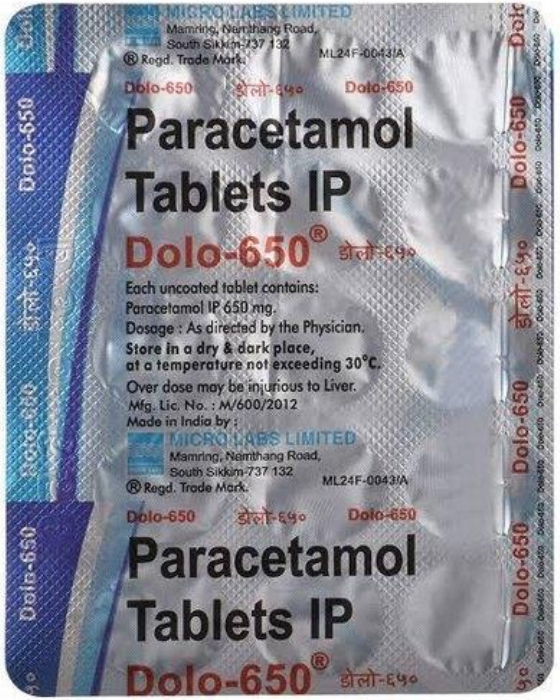
Area's for Different Types of IP Protection in Pharmaceutical Sector

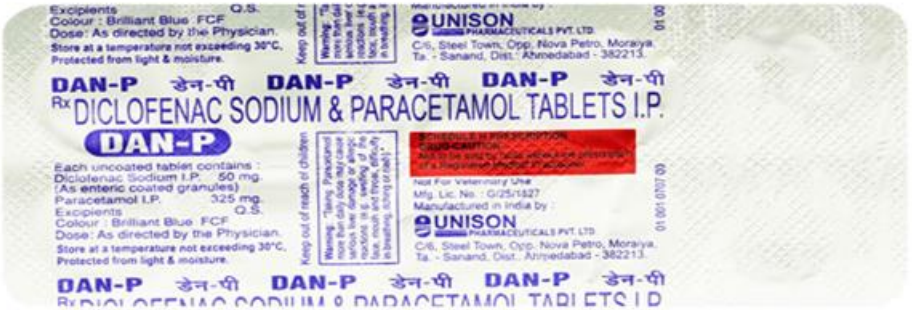
Examples of Branded Trademark Product in India Market



Area's for Different Types of IP Protection in Pharmaceutical Sector

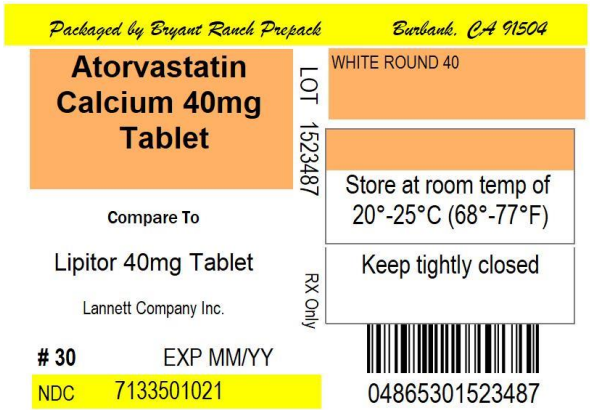
Examples of Different Brands for Same Product in India

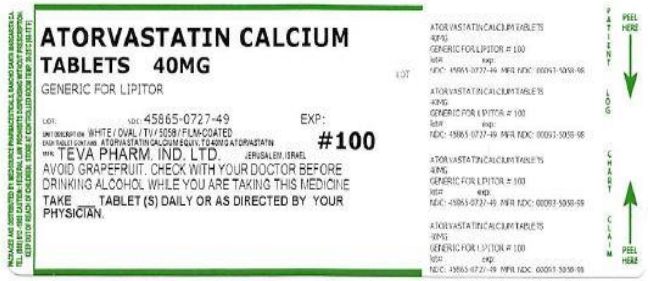




Area's for Different Types of IP Protection in Pharmaceutical Sector

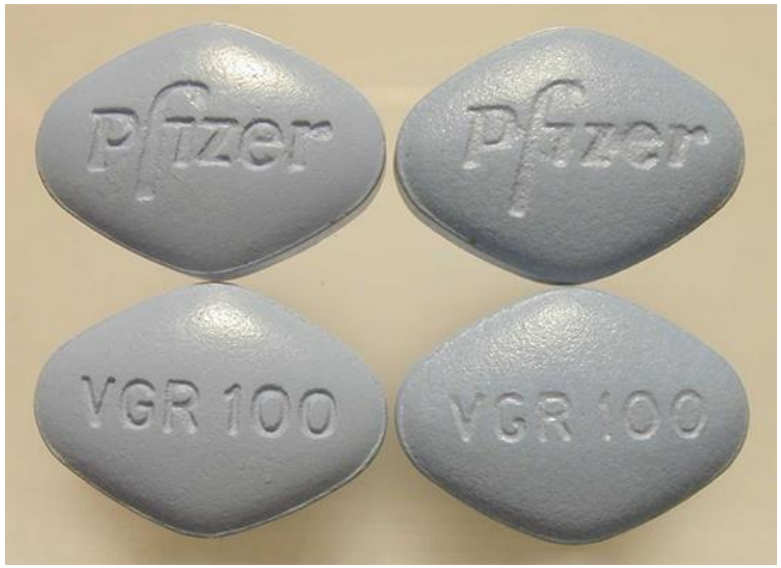
Examples of Different Brands for Same Product in US





Area's for Different Types of IP Protection in Pharmaceutical Sector

Trade Dress in Pharmaceutical Area



25 mg 50 mg 100 mg

Pills not actual size.

Area's for Different Types of IP Protection in Pharmaceutical Sector

Design in Pharmaceutical Area

Area's for Different Types of IP Protection in Pharmaceutical Sector

Copyrights in Pharmaceutical Area

Instructions for Use
XYREM® (ZĪE-rem)
(sodium oxybate)
oral solution, CIII

Read this Instructions for Use carefully before you (or your child) start taking XYREM and each time you (or your child) get a refill. There may be new information. This information does not take the place of talking to your doctor about your (o your child's) medical condition or treatment.

Note:

- **You will need to split your (or your child's) prescribed XYREM dose into 2 separate pharmacy containers for mixing.**
- **You will need to mix XYREM with water before you take or give your child the dose.**
- **Safely store the prepared XYREM doses and take within 24 hours. If the prepared dose was not taken within this time, throw the mixture away.**
- **Both XYREM doses should be taken while in bed.**
- **The pharmacy containers may be rinsed out with water and emptied into the sink drain.**

Supplies you will need for mixing and taking (or giving your child) XYREM. See Figure A:

- Bottle of XYREM medicine
- Dosing syringe for measuring and dispensing the XYREM dose
- Measuring cup that is able to measure about ¼ cup of water (not provided with the XYREM shipment)
- 2 **empty** pharmacy containers with child-resistant caps for mixing, storing, and taking the XYREM doses
- Alarm clock (which may be included in the first shipment).

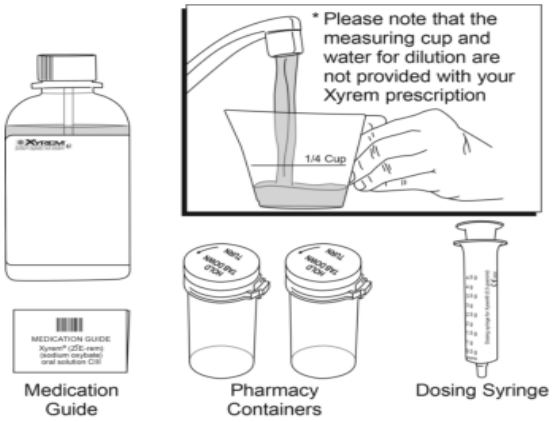


Figure A

Area's for Different Types of IP Protection in Pharmaceutical Sector

Copyrights in Pharmaceutical Area

Step 1: Setup

- Take the XYREM bottle, syringe, and pharmacy containers out of the shipping box.
- Take the syringe out of the plastic wrapper. Use only the syringe provided with the XYREM prescription.
- Fill a measuring cup (not provided) with about ¼ cup of water available for diluting your dose.
- **Make sure the pharmacy containers are empty.**
- Open both pharmacy containers by holding the tab under the cap and turning counterclockwise (to the left). See Figure B.

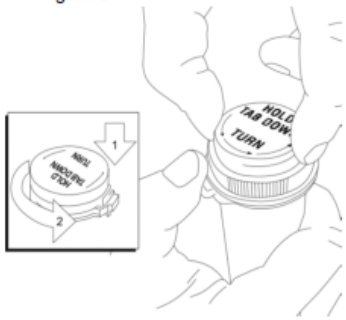
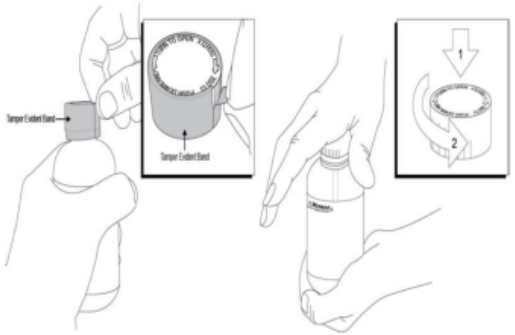


Figure B

Remove the tamper evident band by pulling at the perforations and then remove the bottle cap from the XYREM bottle by pushing down while turning the cap counterclockwise. See Figure C.



Area's for Different Types of IP Protection in Pharmaceutical Sector

Copyrights in Pharmaceutical Area

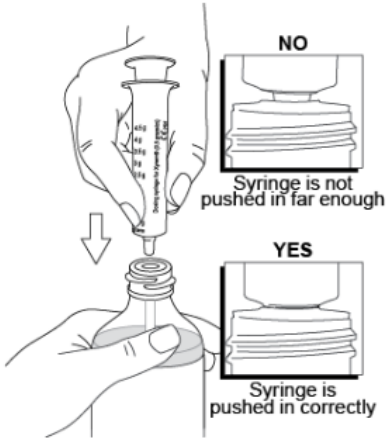


Figure D

Pull back on the plunger until the medicine flows into the syringe and the liquid level is lined up with the marking on the syringe that matches you or your child's dose. See Figure E.

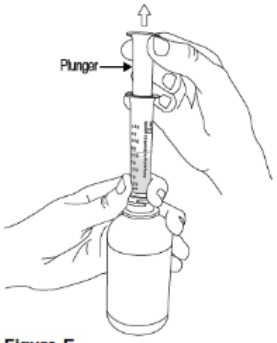


Figure E

Note: The XYREM medicine will not flow into the syringe unless you keep the bottle upright.

Figure F shows an example of drawing up a XYREM dose of 2.25g. Figure G shows an example if an air space forms when drawing up the dose.

Area's for Different Types of IP Protection in Pharmaceutical Sector

Copyrights in Pharmaceutical Area

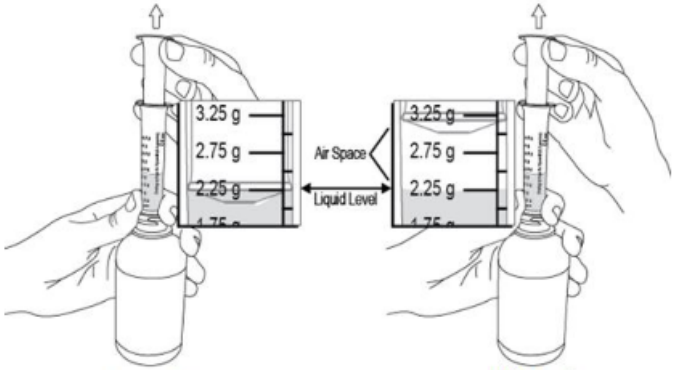


Figure F

Figure G

Note: If an air space forms between the plunger and the liquid when drawing up the medicine, line up the liquid level with the marking on the syringe that matches your or your child's dose. See Figure G above.

- After you draw up the first divided XYREM dose, remove the syringe from the opening of the XYREM bottle.
- Empty all of the medicine from the syringe into one of the provided **empty** pharmacy containers by pushing down on the plunger until it stops. See Figure H.

Figure H

- Using a measuring cup, pour about ¼ cup of water into the pharmacy container. **Be careful to add only water to the pharmacy container and not more XYREM.**
- **All shipped bottles of XYREM contain the concentrated medicine. Water for mixing the medicine is not provided in the shipment.**
- Place the child-resistant cap provided on the filled pharmacy container on the pharmacy container and turn the cap clockwise (to the right) until it clicks and locks into its child-resistant position. See Figure I.

Area's for Different Types of IP Protection in Pharmaceutical Sector

Copyrights in Pharmaceutical Area

Figure I

Step 3. Prepare the second XYREM dose (prepare before bedtime)

- Repeat Step 2 drawing up the amount of medicine prescribed for your (or your child's) second dose:
  - emptying the syringe into the second pharmacy container
  - adding about ¼ cup of water and
  - closing the pharmacy container

Step 4. Store the prepared XYREM doses

- Put the cap back on the XYREM bottle and store the XYREM bottle and both prepared doses in a safe and secure place. Store in a locked place if needed.
- Keep the XYREM bottle and both prepared XYREM doses out of the reach of children and pets.
- Rinse the syringe out with water and squirt the liquid into the sink drain.

Step 5. Take or give the first XYREM dose

- At bedtime, and before you take (or give) the first XYREM dose, put the second XYREM dose in a safe place. Caregivers should ensure all XYREM doses are kept in a safe place until given. You may want to set an alarm clock for 2½ to 4 hours later to make sure you wake up to take (or give) the second dose.
- When it is time to take (or give) the first XYREM dose, remove the cap from the pharmacy container by pressing down on the child-resistant locking tab and turning the cap counterclockwise.
- Drink (or have your child drink) all of the first XYREM dose while sitting in bed. Put the cap back on the first pharmacy container and immediately lie down to sleep (or have your child lie down to sleep).
- You (or your child) should fall asleep soon. Some patients fall asleep within 5 minutes and most fall asleep within 15 minutes. Some patients take less time to fall asleep, and some take more time. The time it takes you (or your child) to fall asleep might be different from night to night.

Step 6. Take or give the second XYREM dose

- When you wake up 2½ to 4 hours later for your (or your child's) second dose of XYREM, take the cap off the second pharmacy container.
- If you (or your child) wake up before the alarm and it has been at least 2½ hours since the first XYREM dose, turn off the alarm and take (or give your child) the second XYREM dose.
- Drink (or have your child drink) all of the second XYREM dose while sitting in bed. Put the cap back on the second pharmacy container and immediately lie down (or have your child lie down) to continue sleeping.

How Pharmaceutical Company manages IP Life Cycle?

Stage 1:

New Chemical Entity Program (NCE)/Pre-clinical program

When molecule is in initial pre-clinical stage program (animal study) – RI (Research Institutes) file patent application, so that concept can be protected for drug molecule.

Advantage: 20 years life (can be extended 5 years more) – starts from Day 1

Stage 2:

Clinical program

When the drug molecule gets finalized, then the RI start activity for finished drug formulation preparation with clinical program in human. Parallel, IR files patent application program for different parts of the product such as drug formulation, drug combination, clinical data, dosing regimen, method of treatment, polymorphs, salts, process of preparation of drug substance etc.

Advantage: 20 years life - however it will start from the day application file - suppose if 5 years gap between stage 1 and stage 2 activity then Day 1 will be considered after 5 years time and 5 years advantage in product life

How Pharmaceutical Company manages IP Life Cycle?

Stage 3:

New Drug Application Program (NDA)

During this stage, If there is chronological invention in the stage 2 product then RI files patent application to extend the life of product by having rights.

- Formulation part (specific product composition)
- New Indication part (Hypertension to Diabetic)
- New process part (Process A to Process B)
- Packaging part (Blister to Bottle)
- Alternate dosage form part (Tablet to solution)

Advantage: 20 years life - however it will start from the day application file - suppose if 10 years gap between stage 1 and stage 3 activity then Day 1 will be considered after 10 years time and 10 years advantage in product life

Country per se IP Protection in Pharmaceutical Sector

India:

20 years IP rights from patent filing, no other rights

USA:

20 years IP rights from patent filing, however below are specific rights provided in pharmaceutical area.

Market exclusivity provided by regulatory approval for USA in IP area

NCE (New chemical entity) – 5 years program

ODE (Orphan drug) – 7 years program

Other exclusivity – 3 years program

Patent Term Extension – 5 years added to patent life

Paediatric exclusivity – 6 months

Country per se IP Protection in Pharmaceutical Sector

Europe:

SPC (Supplementary Protection Certificate) – 5 years added to patent life

DE (Data exclusivity) – 8 years

ME (Market exclusivity) – 2 years

Paediatric exclusivity – 6 months

Canada:

DE (Data exclusivity) – 6 years

ME (Market exclusivity) – 2 years

Paediatric exclusivity – 6 months

Australia:

Patent Term Extension – 5 years added to patent life

NCE (New chemical entity) – 5 years program

How IP Strengthens Pharmaceutical Business?

- Drug patents grant the originator company to market exclusivity for a fixed term of 20 years from the patent's original filing date.
- By giving this 20-year patent term in which the government cannot regulate the price, market exclusivity allows pharmaceutical companies to have a monopoly over the market.
- To maximize their profit, pharmaceutical companies work on extending the exclusivity of a drug.
- For example, AbbVie extended the manufacturing exclusivity of Humira by delaying generic companies from manufacturing generic entrants until 2023.
- The market exclusivity can be lengthened anywhere between 180 days to 7 years.
- Thus, due to efforts to derive profits from patents, pharmaceutical companies' patents contribute to roughly 70-80 percent of their overall revenues.

How IP Strengthens Pharmaceutical Business?

- Patents in the pharmaceutical industry are normally referred to as their product portfolio and are the most effective method for protecting innovation and creating significant returns on investments.

- Accordingly, as mentioned above, patents help in recouping costs related to research, development, and marketing of a drug.

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- Accordingly, patents help in recouping costs related to research, development, and marketing of a drug.

How IP Strengthens Pharmaceutical Business?

- Patents not only help pharmaceutical companies recoup investments, they can also act as a shield against infringement claims. Strong patent protection can safeguard drugs from potential infringers.

- Without consent from the patentee, other competing companies cannot use, make, or distribute the invention. However, because a drug can be easily imitated by competitors, bringing an infringement suit can also protect a patentee's rights.

Landmark Pharmaceutical IP Cases

Section 3(d) – Imatinib Mesylate Crystalline Form

- **Section 3(d) of the Act recites as follows:** "the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.
- Novartis filed patent applications of pharmaceutically acceptable salts of a drug - "imatinib" and the patents were granted in the USA.
- After this Novartis filled patents application which claimed for **"beta crystalline"** form of imatinib mesylate and a patent was granted in the USA and other countries.
- The Indian Patent Office rejected the patent based on the ground of failure to promise novelty and non-obviousness.

Landmark Pharmaceutical IP Cases

Section 3(d) – Imatinib Mesylate Crystalline Form

- They said it is a modified version of an existing drug hence on the ground of Section 3(d) the patent cannot be granted.
- Novartis argued that beta crystalline form is a polymorph of imatinib mesylate and it showed better flow property, improvement in thermodynamic stability, reduced hygroscopicity and augmented bioavailability.
- At last, the Supreme Court declared that although the beta crystalline form of imatinib mesylate enhanced the bioavailability of the drug, it did not prove enhancement of efficacy hence it was found to be non-patentable under **Section 3(d**) in India.
- The same product patent was granted in USA but rejected in India as patentability criteria have been provided in TRIPS but their interpretation may vary from country to country.
- In India, the many aspects of intellectual property rights are dealt with in particular legislations enacted by the Parliament.

Landmark Pharmaceutical IP Cases

Section 3(d) – Imatinib Mesylate Crystalline Form

- Section 3(d) has created a significant impact in determining the patentability of pharmaceutical derivatives in India. Indian Patent Office opposes the concept of "evergreening" which is a practice of inventors of patented products for extending their monopoly period by various strategies (for example over associated delivery systems, or new pharmaceutical mixtures, etc.)
- At last, the Supreme Court declared that although the beta crystalline form of imatinib mesylate enhanced the bioavailability of the drug, it did not prove enhancement of efficacy hence it was found to be non-patentable under **Section 3(d**) in India.
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Landmark Pharmaceutical IP Cases Sec 3(d)

Landmark Pharmaceutical IP Cases

Section 3(e)

- *"a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance".*

- It is a well-accepted principle of Patent Law that mere placing side by side of old integers so that each performs its own proper function independently of any of the others is not a patentable combination, but that where the old integers when placed together has some working interrelation producing a new or improved result, then there is patentable subject matter in the idea of the working inter relations brought about by the collocation of the integers.

Landmark Pharmaceutical IP Cases

Section 3(e)

- A patent granted to Troikaa Pharmaceuticals (IN231479) entitled **"injectable preparations of Diclofenac and its pharmaceutically acceptable salts"** was revoked u/s 3(e) and lack of inventive step.
- The patent office during the examination of the patent application failed to raise objection u/s 3(e) and granted a patent to Troikaa Pharmaceuticals.
- A post grant opposition was filed by "LINCOLN PHARMACEUTICALS LTD (opponent) against the granted patent.
- The opposition board later found that no data showing the synergistic effect was furnished by the Patentee. Excerpts from the order as below.

Landmark Pharmaceutical IP Cases

Section 3(e)

- It is clear that the composition of the impugned application under opposition does not must meet the above requirements that the composition is a not mere admixture and has the synergistic effect. Explicitly, the composition must noticeably show synergistic effect in respect of 'reduction of pain' as the same has claimed to address the said problem.
- However, there is no data provided in the specification which proving that there is a reduction in pain at the site of injection. In fact, not a single example provided in the composition which could prove there is reduction in pain while injecting.
- No clinical data of the claimed formulations is presented in the complete specification to show less pain when increased therapeutic dose of 75mg in 1 ml is used over the prior art diclofenac injections.

Future of IP in Pharmaceutical Industry

- With a history of high cost R&D and high-risk IP strategies, pharmaceutical companies were forced to battle copycats and settle for reduced periods of patent protection.
- This impacted the motivation and investment that is necessary for pharmaceutical innovation.
- The emergence of biotechnology has revitalized the pharmaceutical industry and fueled innovation in technology that could significantly alter the effects of diseases in the future.
- Pharmaceutical firms should have an efficient intellectual property strategy to optimize investment returns while maintaining robust patent protection. Promoting innovation is essential for drug research, and Intellectual Property Rights (IPR) may help you reach your aim of having a competitive advantage.

Thank You