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What Your Clinical Study Design Reveals About Your Clinical Packaging Needs

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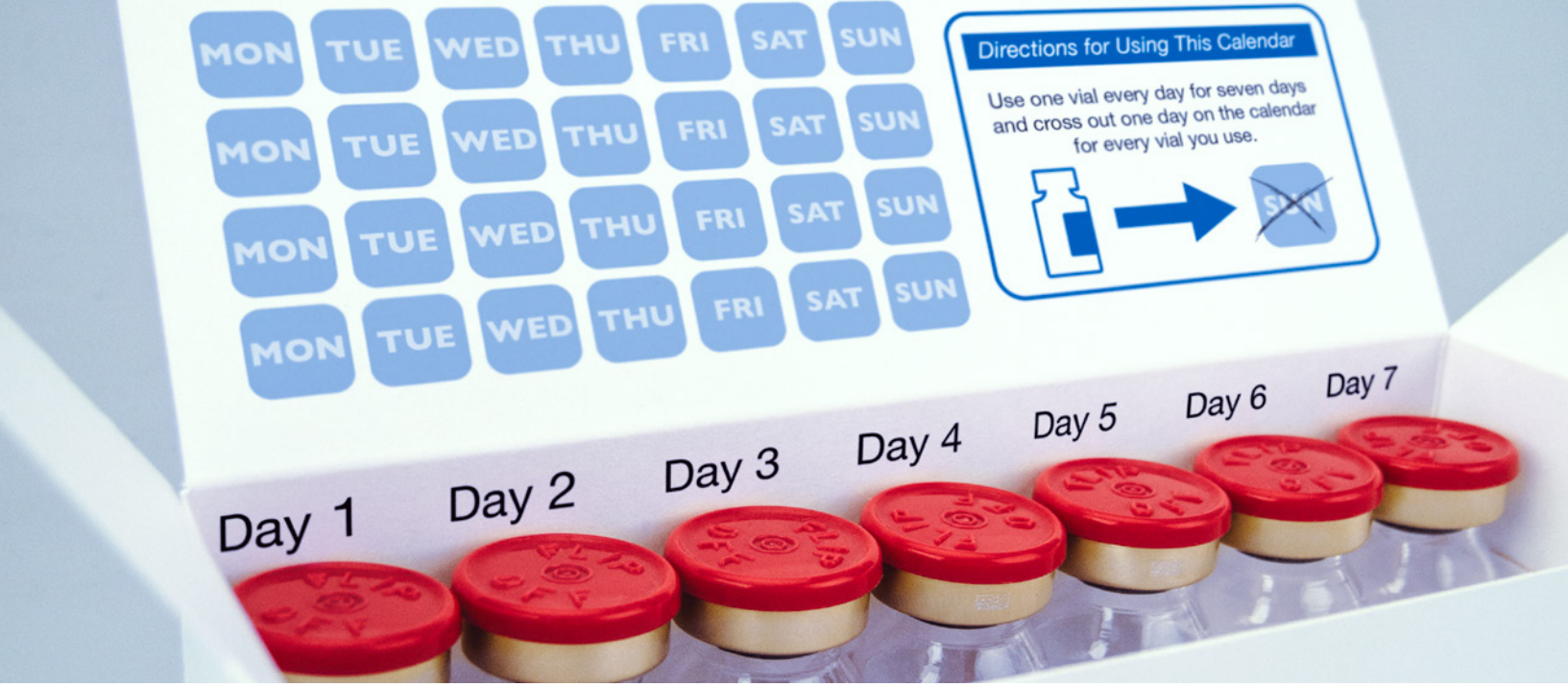
EXCELLENCE IN PHARMACEUTICAL OUTSOURCING FROM MOLECULE TO MARKET



As the cost and complexities of drug development increase, so do the challenges of global clinical trials. Today's sponsors must be able to manage and coordinate multiple resources, processes, and locations with speed and accuracy to design effective and efficient clinical trials. Securing a stable supply chain to deal with the uncertainties of clinical trials is critical. One misstep can have a profound impact not only on the cost and time of your trial but also on its overall success.

To ensure the timely delivery of the necessary supplies, a sponsor must have a strong clinical packaging strategy that takes into account the most important details of its clinical study design. These details encompass the intricacies of logistics, distribution, staffing, patient recruitment, patient adherence to therapy, and regulatory compliance. By engaging an agile partner with the ability to identify the best supply strategy for packaging and shipping your product, a sponsor can avoid costly interruptions to its clinical supply chain. A competent partner should also be able to set a reliable plan in motion that successfully manages material readiness throughout the duration of clinical testing. The goal is to be able to respond appropriately to any surprises or issues that could not only jeopardize your study but also potentially delay your product's development and launch.

Plan your clinical packaging strategy early

Engaging a clinical packager early provides you with a trusted resource that can help you think through some of the challenges of planning and designing a study; it can also advise you during any unexpected obstacles that can often arise during a clinical trial. One detail of a clinical packaging strategy is specific information to determine how the drug products in a trial should be distributed to a sponsor's various sites. While these details are not always immediately available, you should not wait until you have them before contacting a clinical packaging partner.

"If a sponsor waits too long to engage a packager, the packaging options can become limited due to time, which could negatively impact the patient/user experience."

In addition, if a sponsor waits too long to engage a packager, the packaging options can become limited due to time, which could negatively impact the patient/user experience. For example, in a scenario where a clinical trial has a complicated dosing plan, a wallet with blister strips can help patients remember how and when to take their medication. Preparing the drug in blister packs takes time though, so the later study size information and dosing instructions are provided to a partner, the more difficult it is to use this packaging option. An alternative to blister packs is bottles. In studies where dosing size and frequency can change regularly, the right packaging can be the difference between patient compliance and noncompliance.

These are just a few reasons why early engagement is vital and why it is necessary to have a knowledgeable partner. With proper and early planning, it can help anticipate and overcome challenges that could derail your clinical program and potentially the commercialization timeline.

Key factors for clinical packaging

- **Study size and enrollment rate**
- **Timeline and duration**
- **Dosing configuration**
- **Temperature**
- **Label & package considerations**

The key details needed to develop your clinical packaging strategy

The below aspects of your clinical study design will have the most impact on determining your clinical packaging design and shipment requirements:

Study size and enrollment rate

Your clinical study size (number of patients and required dosing) determines the amount of supply required. Another important piece of information is the trial's expected enrollment rate. The enrollment rate helps you plan for how large or small your shipments to each clinical site should be. It also helps determine the optimal shipping frequency. A study could have 10,000 participants, but the enrollment rate could be initially high and gradually lowered over the course of months or even years, which means supply must also be staggered accordingly. If only 10 of those patients are enrolled for the first month, you do not need materials for 500 patients waiting at the clinical site on day one. Conversely, if 300 people of a 500-person study are expected on the first day, ample supply will need to be delivered to the clinical site by the first patient-in date.

In scenarios where a site is handling multiple studies with different protocols, each package should be labeled clearly and delivered with precision. In this situation, a clinical packager that can successfully execute a just-in-time (JIT) solution is especially useful. With JIT, a packager can package, label, and ship a drug only as it is needed, thereby maximizing efficiency and helping to control the drug supply.

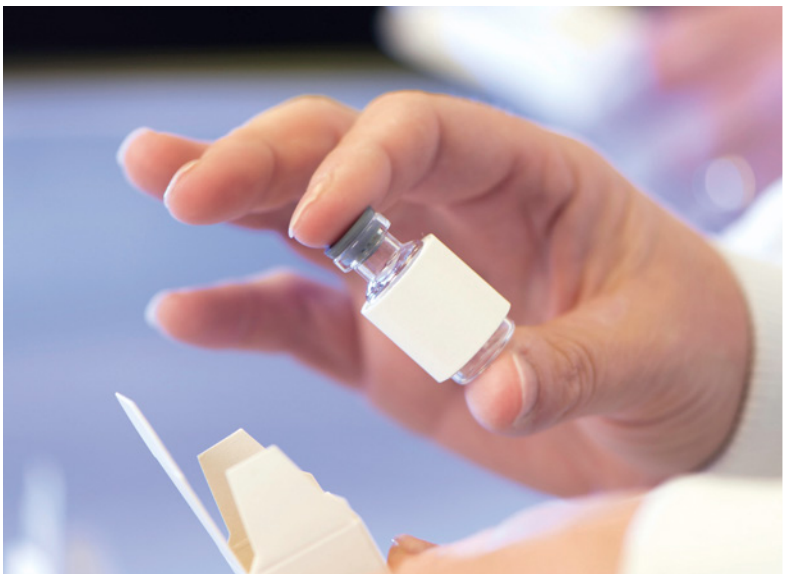
Timeline and duration

A significant milestone for a sponsor in a clinical trial's timeline is the first patient-in date. This is the first date a patient is expected to start taking a drug. Some questions the packager might ask to help ensure a drug arrives in time for the first patient-in date are:

- When will the first patient(s) be screened or enrolled in the study?
- What is the first anticipated dosing date?
- When does the first shipment need to leave the packager's site in order to arrive on time?

It is critical your partner is flexible and responsive, so it is able to adjust appropriately and quickly in case of unexpected changes to these answers or if there are delays in receiving the necessary material. Other crucial details include if any of the clinical trial will be conducted internationally, and if so, if the packager has proven global depots that can service those sites. When it comes to conducting clinical trials internationally, knowing these other factors can also be crucial to laying the foundation of a strategy and meeting the first patient-in date:

- the number of countries
- the label requirements of different countries or governing bodies
- import rules
- an understanding of the Qualified Person (QP) process[1] if a trial is in the European Union



Finally, what are your reconciliation and destruction requirements, both locally and internationally? Will leftover materials be disposed of at the clinical site, or should they be handled at the packager's facility? If the packager is responsible, all leftover material will be sent back to the packager as returns so it can be reconciled in one place and then sent for destruction.

Drug requirements that could affect shipping

Several characteristics about a drug can determine its shipping requirements. These characteristics can include:

- **Dosing configuration** – A drug's dosing structure includes how many patients are on which doses, which can vary based on the study design and the drug being tested. A packager needs to keep user-friendliness (from the patient side and the dosage administration side) in mind when deciding how to best present these dosing configurations. For example, presenting doses in a blister package and labeling it so patients understand to take a pill on a specific day can be clearer than presenting three bottles of pills to the patient and giving them instructions on which bottle to take a pill out of and when. When a sponsor company comes to a packager, it needs to have a clear idea of the drug's dosing configuration.

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- **Temperature** – Some drugs are sensitive to various temperature conditions, so a packager will need to know the required temperature conditions for storage and shipment. There is no room for error when it comes to temperature-sensitive drugs, as any excursions can affect safety or efficacy. Even factors such as moisture or light can affect a drug compound's stability. A clinical packager must also have the capabilities, shipping materials, and capacity to package and label with all of a drug's required conditions and limitations in mind. For example, dry ice can be used during shipping to maintain the temperature of a drug that needs to be kept colder than -20 degrees Celsius. However, if a drug needs to be kept at -20 degrees Celsius, it must be packaged in a walk-in cold room that can manage those conditions. There may also be times when very little stability data is available for a new drug product or formulation. In these instances, the packager may have to conduct labeling and kitting of clinical supplies in the same environment as the long-term storage of the material (e.g., -20 degrees Celsius or 2 to 8 degrees Celsius).
- **Label and package considerations** – Certain compounds in drugs can interact with packaging and labeling materials. For example, a customer might use a glass vial instead of plastic because of interactions between the drug and

the plastic. If a plastic container is suitable, the customer may still want to use a label that has a nonleachable adhesive on the back, so it will not interfere with the drug through the walls of the container over time. When using comparator drugs, a packager could suggest sourcing an opaque back label so a patient cannot read any commercial information on the package. Finally, an understanding of the information that needs to be on a label for a given study will help determine label size and complexity.

When a blister pack is used for a drug product, there are key factors to consider as well. A drug that is highly moisture or light sensitive may require an all-aluminum structure, or cold form, to contain the product. If light is not an issue, then perhaps a plastic material, or thermoform structure, is adequate but may still require high moisture barrier characteristics. In this instance, there are specific polymer films that can be utilized to protect the product yet still offer the clarity and other benefits of a plastic-formed container.

Once a packager knows if a drug is sensitive to any of the factors above, it can create an appropriate kit design that not only ensures a drug arrives on time but also that the package system does not alter the drug's safety or efficacy along the way. Collecting this information can be an overwhelming task for any clinical supply manager who is sometimes managing the complexities of drug development.

Partnering with a knowledgeable clinical packager that can remain flexible and responsive to the changing needs of a clinical trial can be an indispensable resource, especially as key deadlines approach. With the price tag of bringing a drug to market recently estimated at nearly $2.6 billion[2],the cost of a mistake may be too high for some companies to overcome. More importantly, for the patients who rely on these drugs to improve the quality of their life and, in many cases, save it, the cost may be even higher.

References

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[2] Tufts Center for the Study of Drug Development, Tufts CSDD Assessment of Cost to Develop and Win Marketing Approval for a New Drug Now Published — http://csdd.tufts.edu/news/complete_story/tufts_csdd_rd_cost_study_now_published

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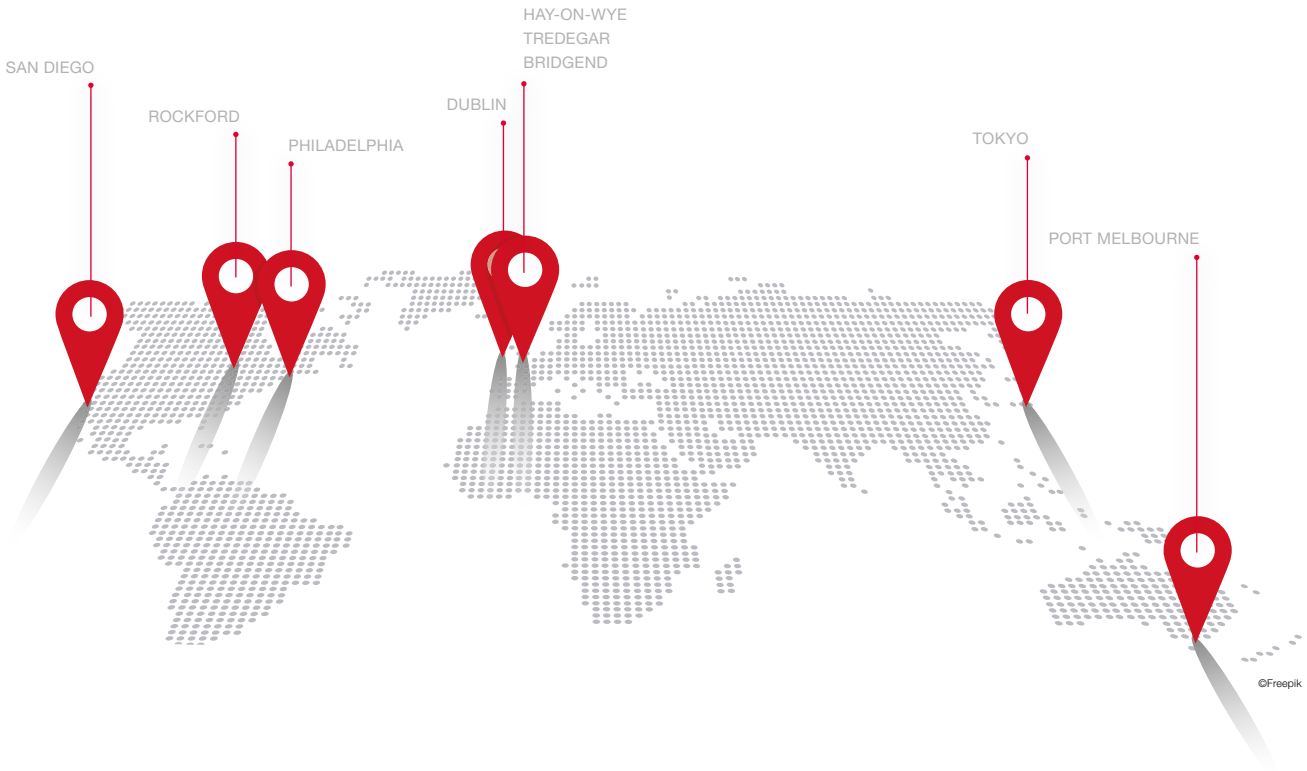

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