How to fast track GMP manufacture for clinical studies

When bringing new drugs to market, time is of the essence. It's essential to move rapidly towards key milestones, whilst remaining compliant with regulatory requirements.

Good manufacturing practice (GMP) is essential to ensure products are safe and of a high enough quality for clinical studies. Any delays or deviations in the GMP process flows could breach regulations, entail penalties, lead to market setbacks - or even endanger patient health.

Fast-tracking GMP manufacture is, however, extremely challenging, with many pitfalls to avoid. In this paper we'll discuss some of the main obstacles to fast-track GMP, along with some recommendations on how to overcome them.

1 Supply chain disruptions

A recent McKinsey survey revealed that **73% of companies** experienced supply chain disruptions during the Covid-19 pandemic while The Healthcare Distribution Alliance (HDA) revealed that **83% of distributors** saw increased lead times due to pandemic-related disruptions to the supply chain.

These statistics won't come as a surprise to most pharmaceutical manufacturers. Even without the added burden of a pandemic, supply-related issues, from natural disasters and shipping delays to customs issues and more, can cause big disruptions and set GMP manufacture off-track.

How to reduce disruptions in the supply chain?

> To minimise interruptions and maintain continuity it's crucial to have a robust sourcing strategy in place. Good practices include diversifying suppliers and transport methods, establishing contingency plans, and investing in data analytics and technology to anticipate and respond to potential risks.

2 Equipment malfunctions

The International Society for Pharmaceutical Engineering (ISPE) reported equipment breakdowns as the **third most common cause of delays** in pharmaceutical manufacturing. It's an issue that's costing manufacturers up to **$250,000 per hour** in lost production, too, according to a Frost & Sullivan report.

Factors that contribute to malfunctions include:

- Aging equipment
- Operator Errors
- Lack of preventative maintenance

- Over-maintenance

How to reduce equipment malfunctions?

A robust maintenance schedule is imperative in order to overcome this problem. It's essential to enforce rigorous protocols and employ staff that are skilled in overseeing them.

3. Contamination issues

According to an ISPE survey contamination is the second most common cause of production delays, with serious consequences including:

- Product defects and recalls
- Safety hazards
- Regulatory violations

Contamination can happen at any stage in the complex production of investigational products. From raw materials and human error to improper handling or contact with unsterilised surfaces.

How to reduce incidences of contamination?

GMP processes for clinical trials can be optimised using **Process analytical technology (PAT)** to monitor and control critical process parameters in real time.

Single-use systems: These are designed to produce a single batch which is then discarded eliminating the need for cleaning between batches which risks cross-contamination and ensures a sterile system for every batch.

It's important to implement a robust maintenance plan, and make sure to use **state of the art facilities** that are equipped to optimise the safety of products in development, so that processes are sterile and safe. In this way you can rest assured drugs will be at optimum standard for batch processing.

4. Regulatory compliance

Meeting GMP manufacturing standards presents a real challenge in this rapidly evolving landscape. Applying GMP inconsistently, or lacking the requisite documentation, can bring about serious hold-ups in the manufacturing process.

How can you ensure compliance?

Early involvement of regulatory agencies: Working with a regulatory body throughout the entire process is essential. This will ensure the development process aligns with the

regulations of the intended markets and enables manufacturers to make accurate and timely decisions.

Regulatory experts need to be consulted at every milestone and before finalising pivotal studies to ensure all issues are addressed before submission for approval. This will help to prevent manufacturing delays and overcome regulatory hurdles early on.

Taking a **Quality by Design (QbD) approach** is essential right from the start (rather than just implementing this strategy at the latter stages of development simply to meet regulatory requirements). By defining critical quality attributes early in development any nasty surprises further down the line can be avoided.

It's also important to ensure that **good contingency plans** are in place to ensure the manufacturing process is adaptable and fit for purpose. You must be able to adjust your process development and validation strategies based on any emerging requirements from regulatory authorities.

Automation: Robotics and automated equipment can stabilise processes and help pharmaceutical companies achieve compliance requirements, whilst reducing the delivery of safe, efficient and profitable drugs in a shorter time-frame.

- Electronic documentation
- Packaging
- Data management
- Process control factor monitoring
- Error and deviation reports

Conclusion

Complying with Good Manufacturing Practice (GMP) during the production of an investigational product (IP) for clinical studies can be a time-consuming, expensive, and complex process. That’s why, in order to speed up GMP whilst ensuring drugs in development are safe and compliant, many pharmaceutical companies choose to work with a CDMO partner.

A good CDMO partner will provide you with the expertise, experience and capabilities to take on all aspects of development so you can fast track your GMP manufacture without sacrificing on quality and safety.

A full-service CDMO can help you:

Safeguard your supply chain

You can reduce your exposure to supply chain risks by working with an agile, full-service CDMO partner. They can provide you with a one-stop shop for all your pharmaceutical development

requirements with low-cost access to state of the art laboratory facilities. It's recommended to work with a partner that has the capability to produce the active pharmaceutical materials required for the development of products. This can mitigate the risks associated with unpredictable supply of drugs and help you adapt to any ongoing, unpredictable disruptions in the supply chain.

Deliver safe and high quality products in the shortest timelines possible

Finding a fast-track GMP specialist to take over key processes for you can help to mitigate delays from possible contamination problems and incidences of equipment malfunctions. Ensure your selected partner's laboratories and equipment are of the highest quality possible and maintained by qualified staff to ensure fast, continuous quality of production.

Understand, interpret and adapt to any regulatory requirements

By working with an experienced CDMO you can reduce your risks when it comes to regulatory compliance. They can ensure that all processes are robustly planned (using a QbD approach) right from the start, from defining the scope of projects, to dosage parameters and manufacturing process flows at all stages (from raw materials, to personnel, to shipping, and packaging).

Summary

Even the largest of pharmaceutical organisations can benefit from working with a CMDO to access the breadth and depth of their expertise, and their knowledge of technologies and compliance issues.

Pinnacle IMP: Your fast track GMP manufacturing partner

Pinnacle IMP has extensive experience in project managing batch GMP manufacture for pharmaceutical companies and can oversee all processes from start to finish. With our dedicated, fully equipped laboratory facilities in Loughborough, UK and a team of multi-disciplinary highly qualified experts (including chemists, researchers and development experts), we can ensure your GMP projects are completed on time to the highest quality.

Most importantly of all, with our support you can speed up delivery of drugs to where they're needed most - to patients.

References

1. Supply Chain disruption and resilience by McKinsey
2. COVID-19's Impact on the Pharmaceutical Industry by Thomas (2020)
3. Pharmaceutical Equipment Reliability Survey by ISPE (2018)

4. Trends and Opportunities in the Pharmaceutical Processing and Packaging Equipment Market by Frost & Sullivan (2018)