Challenges and Solutions in Clinical Supply Management

• Pamela Osborne
  Sr. Clinical Supply Chain Mgr
• Key Takeaways:
  • Aspects to consider when supply planning
  • Influence of early decisions and impact on outcome as trial progresses
  • How decisions may/may not put patients and the trial at risk

• Interactive review of key factors that affect supply planning:
  • Package Design
  • Dispensing Plan
  • Label Grouping
  • Crisis management
The Velocity of Clinical Trials

- Increased Costs
- Increased Complexity of Trials
- Low Success Rate
- Few New Drug Approvals
- Breadth and Scope
- Sense of Urgency
Breadth and Scope of Clinical Trials

Number of Registered Studies Over Time

Source: http://clinicaltrials.gov/ct2/resources/trends
Approvals of Medicines

Many examples exist of major therapeutic gains achieved by the industry in recent years... anecdotal and statistical evidence suggests that the rapid increases that have been observed in drug-related R&D spending have been accompanied by major therapeutic gains in available drug treatments.2

Congressional Budget Office

Note: New medicines include New Drug Applications and Biologics License Applications

Probability of Success for Investigational Drugs

Clinical Approval Success Rates by Therapeutic Area

GI/Metabolism
CNS
Cardiovascular
Respiratory
Onc/Immunologic
Sys Anti-Infective

Success Rate

Only Approximately **20%** of new drugs that enter clinical testing will receive U.S. marketing approval.¹

Increased Cost of Developing New Drugs

Operational and Strategic Challenges

According to research done by Tufts Center for the Study of Drug Development:

• Clinical supply professionals are faced with greater operational and strategic challenges.

• Factors contributing to these challenges include:
  • Rising volume of global clinical trial activity
  • Logistical complexity
  • Regulatory pressures
  • Shorter study start-up timelines
  • Study site locations
  • Increasing number of study subjects
  • Shorter development timelines
Top Five Challenges in Clinical Supply Chain

- Short lead times
- Operations-supply team communication
- Protocol readiness/accuracy
- Better forecasting
- Visibility

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Ranked First</th>
<th>Second</th>
<th>Third</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short lead times</td>
<td>25%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Operations-supply team communication</td>
<td>15%</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Protocol readiness/accuracy</td>
<td>15%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Better forecasting</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Visibility</td>
<td>10%</td>
<td>5%</td>
<td>--</td>
</tr>
<tr>
<td>Supply management</td>
<td>5%</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>Planning function is not well-defined</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Site location</td>
<td>5%</td>
<td>15%</td>
<td>--</td>
</tr>
<tr>
<td>Resources</td>
<td>5%</td>
<td>--</td>
<td>10%</td>
</tr>
<tr>
<td>Resource utilization</td>
<td>5%</td>
<td>--</td>
<td>5%</td>
</tr>
<tr>
<td>Communication with regional offices</td>
<td>--</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Outsourcing</td>
<td>--</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Capacity constraints</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Performance metrics</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: Tufts Center for the Study of Drug Development
“It’s so easy…”

- Just use the standard formula for planning & forecasting IP:
  
  $$\text{NUMBER OF SUBJECTS PER SITE} \times \text{NUMBER OF SITES FOR ALL COUNTRIES} \times \text{NUMBER OF DISPENSING DOSES} = \text{QUANTITY OF IP TO MAKE FOR TRIAL}$$

- Maybe it’s not so easy…
  - Enrollment speed
  - Milestone attainment
  - Dating and Extensions
  - Material Availability
  - Blinding
  - Distribution Systems
  - Numerous Dosages, Forms, Sizes, Shapes

- Measure twice, cut once. Repeat as necessary
The following challenges will demonstrate:

The importance of critically thinking through key decisions to be made when building a supply plan and their impact on:

- Forecasting
- Operational communications
- Lead times

…and ultimately influence the success of the trial
Information overload?!

- **Protocol**
  - Study Summary
  - Planned Duration of Treatment
  - Study Drug Dosage and Administration
  - Study Milestones
  - Titration and Stratification rules

- **Bulk Drug Information**
  - Allowable fill range
  - Dating and possibility for dating extension
  - Which countries accept what dating
  - Temperature Storage conditions
  - Cost to manufacture
  - Quantities Available
  - Source for Commercial Material

- **Supply Chain**
  - Label, Packaging & Distribution Timelines
  - Manufacturer -> Packager -> Distributor -> Site
Challenge: Dispensing Plans & Package Design

- **Patient Compliant Packaging**
  - Bottles vs Blisters

- **Patient Focused Packaging**
  - Indication
  - Disease state

- **Flexibility of Supply**
  - 1x vs 10x cartons
  - Blinding

- **Reduce the number of package types**
## Impact of Package Design and Dispensing Decisions on the IP Supply Chain

<table>
<thead>
<tr>
<th>Decision</th>
<th>Impact</th>
<th>Supply Chain Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Compliant &amp; Focused Packaging</td>
<td>§ Helps achieve more accurate study results.</td>
<td>§ Operational Communications</td>
</tr>
<tr>
<td></td>
<td>§ Helps patients adhere to complex dosing regimens requiring several combinations of drug</td>
<td>§ Forecasting Complexity</td>
</tr>
<tr>
<td></td>
<td>§ Protection from damage and environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ Easier returns and drug accountability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ Retention of patients because of ease of use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ Method of administration in trial impacts commercial administration</td>
<td></td>
</tr>
<tr>
<td>Flexibility of Supply &amp; Low Number of Package Types</td>
<td>§ Decreased demand forecasting complexity</td>
<td>§ Operational Communications</td>
</tr>
<tr>
<td></td>
<td>§ Increased flexibility in supply management</td>
<td>§ Lead Times</td>
</tr>
<tr>
<td></td>
<td>§ Decreased overages</td>
<td>§ Forecasting Complexity</td>
</tr>
<tr>
<td></td>
<td>§ Decreased packaging lead times and/or instances</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ More efficient use of storage space (warehouses and site)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ Less complex IRT forecasting and set up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>§ Fewer number of site shipments</td>
<td></td>
</tr>
</tbody>
</table>
Challenge: Determining IP Label Groups

- Facts:
  - Global Trial in 25 countries: US + EU + ROW
  - US has FPV first
  - All countries accept the maximum dating
  - 3 weeks to get a Single Panel label
  - 7-10 weeks to get a booklet

Choose one of the options below:

a) US – Single Panel and OUS/ROW Booklet
b) Regional Booklets – NA, EU, AP
c) Other - come up with your own solution! -
# Impact of Label Grouping Decisions on the IP Supply Chain

<table>
<thead>
<tr>
<th>Decision</th>
<th>Impact</th>
<th>Supply Chain Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low number of label groups</td>
<td>▪ Decreased packaging cost/instances</td>
<td>▪ Forecasting Complexity</td>
</tr>
<tr>
<td></td>
<td>▪ Decreased overages</td>
<td>▪ Operational Communications</td>
</tr>
<tr>
<td></td>
<td>▪ Increased supply flexibility</td>
<td></td>
</tr>
<tr>
<td>Grouping countries with like dating acceptance</td>
<td>▪ Fewer forecasting instances and decreased forecasting complexity</td>
<td>▪ Forecasting Complexity</td>
</tr>
<tr>
<td></td>
<td>▪ Maximized use of material: decreased waste</td>
<td>▪ Operational Communications</td>
</tr>
<tr>
<td></td>
<td>▪ Decreased number of resupplies: decreased packaging cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Fewer dating extensions</td>
<td></td>
</tr>
</tbody>
</table>
Massive tornado has hit several Cities in the Midwest...
Challenge – Emergency!

• A tornado has hit the US warehouse and all of the IP was lost or damaged

• Considering that:
  • US is on its own label
  • Patients actively on drug
  • Enrollment is ahead of plan
  • No resupplies planned because there was sufficient quantity and dating on current supplies

• What are your next steps?
• What could you have done differently?
Life Happens…there Goes Your Forecasting!
What could you do?

- Push out the patients to the maximum visit window
- Micro Manage IP
- Redistribution
- Hold Enrollment
- Expedite unplanned resupply
It all comes back to…
Efficient Supply Planning

- Controlled Costs
- Improved Patient Outcome
- Effective Supply Planning & Forecasting
- Accelerated Milestone Attainment
- Breadth & Scope
- Simplified Packaging & Dispensing
Questions?

Pamela Osborne
pamela.osborne@thermofisher.com
Thank you!
SENSE OF URGENCY

INCREASED COSTS

INCREASED COMPLEXITY OF TRIALS

BREADTH and SCOPE

FEW NEW DRUG APPROVALS

LOW SUCCESS RATE

INCREASED COMPLEXITY OF TRIALS

INCREASED COSTS

BREADTH and SCOPE

FEW NEW DRUG APPROVALS

LOW SUCCESS RATE
SENSE OF URGENCY

- INCREASED COSTS
- INCREASED COMPLEXITY OF TRIALS
- LOW SUCCESS RATE
- FEW NEW DRUG APPROVALS
- BREADTH and SCOPE
SENSE OF URGENCY

- Increased Costs
- Increased Complexity of Trials
- Low Success Rate
- Few New Drug Approvals
- Breadth and Scope
INCREASED COSTS

SENSE OF URGENCY

INCREASED COMPLEXITY OF TRIALS

LOW SUCCESS RATE

FEW NEW DRUG APPROVALS

BREADTH and SCOPE

INCREASED COMPLEXITY OF TRIALS

LOW SUCCESS RATE

FEW NEW DRUG APPROVALS

BREADTH and SCOPE
SENSE OF URGENCY

INCREASED COSTS

INCREASED COMPLEXITY OF TRIALS

BREADTH and SCOPE

FEW NEW DRUG APPROVALS

LOW SUCCESS RATE

INCREASED

COMPLEXITY

OF TRIALS
SENSE OF URGENCY

INCREASED COSTS

INCREASED COMPLEXITY OF TRIALS

LOW SUCCESS RATE

FEW NEW DRUG APPROVALS

BREADTH and SCOPE