Target Product Profiles

An Essential Tool in Development and Strategic Management of New or Modified Drugs/Biologics/Devices

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What is a Target Product Profile?

- A Target Product Profile (TPP) is a summary of the drug development program described in terms of labeling concepts.
- It is prepared by all the departments of the company involved in the development of the therapeutic or diagnostic agent.
- Its submission to the FDA is voluntary but has specific benefits.
- The TPP is a “living document” evolving and maturing with increasing knowledge and experience.
The FDA and TPPs

- The FDA strongly advocates the use of a TPP although it does not mandate it.
- The FDA has prepared a Template included in a recent draft guidance [http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm080593.pdf]
- For each element of the label, the template proposes:
  - **Target**: Language in the Package Insert that the sponsor hopes to achieve.
  - **Annotations**: Summary information regarding completed or planned studies.
  - **Comments**: To provide clarity.
- The TPP template links each labeling concept to a specific study or other source of data.
Selected FDA Responses to TPP Submissions

- **Study Endpoint Reviewer**
  - TPP used during endpoint review of a special protocol assessment
    - “The target label language in the TPP helped me evaluate and give the sponsor detailed feedback on what else would be needed to support the desired labeling statements.”

- **Medical Reviewer**
  - TPP submitted as component of Briefing Document for EOP2 meeting
    - “The Indications and Usage part of the TPP was helpful for us to provide additional advice on the necessary information to collect in Phase 3 to meet the companies proposals (if possible).”
Division Director

- TPP submitted Phase 1-3
  
  “Success in drug development is, in some measure, like success in a sport. Take ice hockey as an example. A winning team knows not only where the puck is, but also anticipates where the puck is going to be. A sponsor develops a TPP to clarify where, ideally, the product is going to be.”
• Detailed TPPs have an increasing role in the pharmaceutical industry in Strategic Program Management (SPM)

• TPPs explore various labeling scenarios
  - Target, Minimal, Optimal

• TPPs estimate (for each scenario)
  - Probabilities of Success
  - Development Costs
  - Personnel
  - Manufacturing
  - Market Penetration / Competitors
Assembly of an Industry TPP

- A common template is used for all products
- A TPP is assembled for each product entering development and each new indication for an existing drug/biologic
- Input is elicited from various departments
- The owner is usually the Project Manager who coordinates the activities of specific product development team
- The TPP constitutes an important evaluation tool in “gate reviews”, if such reviews are enabled by the organization
<table>
<thead>
<tr>
<th>Project Name</th>
<th>(Name)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Description</td>
<td>Summary description of the product</td>
</tr>
<tr>
<td>Project Category</td>
<td>Is the project is an additional indication for an existing drug or a new project?</td>
</tr>
<tr>
<td>Strategic Fit and Value</td>
<td>How well does this drug/biologic fit with the core expertise and capabilities of the company?</td>
</tr>
<tr>
<td>Value to Patients</td>
<td>What is the specific value of this drug/biologic to patients? Does it offer therapeutic, safety or ease of use advantages over existing or upcoming drugs/biologics</td>
</tr>
<tr>
<td>Company's competitive position</td>
<td>Does the company have a competitive advantage?</td>
</tr>
<tr>
<td>Company's IP position</td>
<td>Brief summary of the IP position regarding this drug</td>
</tr>
<tr>
<td>Rationale for success</td>
<td>Brief summary as to why the developing team believes that this product would</td>
</tr>
<tr>
<td>Factors for success</td>
<td>Brief statement as to the company’s core competencies and market conditions that would drive a successful outcome</td>
</tr>
<tr>
<td>Key risk factors</td>
<td>Brief statement identifying possible risks</td>
</tr>
<tr>
<td>Consequences for not pursuing the project</td>
<td>What would happen if this project is not pursued?</td>
</tr>
<tr>
<td>Possible alternatives to this project</td>
<td>Are there any alternatives to this project?</td>
</tr>
</tbody>
</table>
## TPP Summary of Efficacy

### Primary Indication

<table>
<thead>
<tr>
<th>Primary Clinical Endpoint (s)</th>
<th>Target Patient Population</th>
<th>Route of Administration</th>
<th>Treatment Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Outcome 1</td>
<td>Clinical Outcome 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is possible that secondary endpoints may result in additional claims</td>
<td>&gt;Target Or =Target</td>
<td>&gt;Target Or =Target</td>
<td>&gt;Target Or =Target (if more than one route is tested)</td>
</tr>
<tr>
<td>The primary endpoint of the pivotal study or studies</td>
<td>Provide entries if more than one primary endpoint</td>
<td>Target (Describe target population)</td>
<td>Target (Describe target route of administration)</td>
</tr>
<tr>
<td>= Target</td>
<td>= Target (if essential for regulatory success)</td>
<td>=Target Or &lt;Target If the least desirable tested route is successful</td>
<td>= Target Or &lt; Target If the least desirable tested route is successful</td>
</tr>
</tbody>
</table>
# TPP Summary of Safety

## Primary Indication

<table>
<thead>
<tr>
<th>Safety</th>
<th>Drug Interactions</th>
<th>Precautions</th>
<th>Contra-indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical</td>
<td>Non-Clinical</td>
<td>Clinical</td>
<td>Non-Clinical</td>
</tr>
</tbody>
</table>

- **Optimistic**:
  - Target safety is usually equivalent to the known safety of the same class or similar classes of compounds that have been approved
  - Laboratory or other findings similar to those observed for the same class or similar classes of compounds that have been approved
  - Interactions similar to those observed for the same class or similar classes of compounds that have been approved
  - Precautions similar to those observed for the same class or similar classes of compounds that have been approved
  - Contraindications similar to those observed for the same class or similar classes of compounds that have been approved

- **Target**:
  - = Target
  - (≤ Target would be acceptable if risk/benefit ratio is favorable)
  - (≤ Target would be acceptable if risk/benefit ratio is favorable)
  - (≤ Target acceptability criteria should be explained)
  - (≤ Target acceptability criteria should be explained)

- **Minimal**:
  - = Target
  - (≤ Target would be acceptable if risk/benefit ratio is favorable)
  - (≤ Target would be acceptable if risk/benefit ratio is favorable)
  - (≤ Target acceptability criteria should be explained)
  - (≤ Target acceptability criteria should be explained)
The TPP may contain additional elements regarding:

- Product design and formulation
  - Purity
  - Contaminants
  - Storage Conditions
  - Shelf Life
  - Any delivery system associated with the drug
- Projected dates of submissions, regulatory approval and launch
- Cost of goods, pricing, market size

Target, optimistic and minimal conditions may be set for these elements.
How to Assemble a TPP

• **Utilize the following:**
  - Define properties of the drug in preclinical development
    - Pharmacokinetics
    - Toxicology
    - Efficacy in animal models
  - Select target indication(s)
    - Structure a TPP for each indication that may require additional development
  - Examine approved claims of competitors (efficacy and safety)
  - Examine the competitive environment for compounds currently in development and likely to be approved in the near future
  - Elaborate on minimal and optimal profiles
TPP as a Strategic Planning Tool

- **Clinical Development**
  - TPP scenarios can be used for:
    - Design of clinical studies
    - Design of detailed timelines
    - Evaluation of risks and creation of mitigation plans
    - Estimation of the possibility of success
    - Estimate budgets/personnel

- **Regulatory /Clinical**
  - Estimation of likely approval dates in various geographies

- **Manufacturing**
  - Evaluation of manufacturing options/expenditure

- **Marketing**
  - Estimation of costs of goods
  - Estimation of pricing
  - Estimation of marketing campaign costs
  - Estimation market penetration (focus groups)
Utilizing TPPs in Development

• **TPPs utilized correctly can:**
  - Assess risks and create risk mitigation plans for all stages of clinical development
  - Assign a probability of success at each phase of clinical development and each indication targeted
    - Assumptions of probability of success at any stage of development should be explained and contrasted to industry norms
  - Promote a team-based approach
    - Compiling TPPs is a team-based activity that enhances collaboration among project team members and increases awareness of the project’s critical issues throughout the organization
## Risk Identification and Mitigation Plan

<table>
<thead>
<tr>
<th>Risk #</th>
<th>Risk</th>
<th>Impact (1 to 5)</th>
<th>Risk of Occurrence (1-5)</th>
<th>Mitigation Action Plan</th>
<th>Ownership (Enter Appropriate Department)</th>
<th>Date for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phase 1 study: (Describe Risk)</td>
<td>1 = minimal impact 5 = maximal impact</td>
<td>1 = unlikely 2 = possible 3 = probable 4 = likely 5 = very likely</td>
<td>Enter mitigation plan (Note if the occurrence of the outlined risk leads to program discontinuation)</td>
<td>Ownership</td>
<td>Date for Action</td>
</tr>
<tr>
<td>2</td>
<td>Phase 2 study: (Describe Risk)</td>
<td>1 = minimal impact 5 = maximal impact</td>
<td>1 = unlikely 2 = possible 3 = probable 4 = likely 5 = very likely</td>
<td>Enter mitigation plan (Note if the occurrence of the outlined risk leads to program discontinuation)</td>
<td>Ownership</td>
<td>Date for Action</td>
</tr>
<tr>
<td>3</td>
<td>Phase 3a study: (Describe Risk)</td>
<td>1 = minimal impact 5 = maximal impact</td>
<td>1 = unlikely 2 = possible 3 = probable 4 = likely 5 = very likely</td>
<td>Enter mitigation plan (Note if the occurrence of the outlined risk leads to program discontinuation)</td>
<td>Ownership</td>
<td>Date for Action</td>
</tr>
<tr>
<td>4</td>
<td>Phase 3b study: (Describe Risk)</td>
<td>1 = minimal impact 5 = maximal impact</td>
<td>1 = unlikely 2 = possible 3 = probable 4 = likely 5 = very likely</td>
<td>Enter mitigation plan (Note if the occurrence of the outlined risk leads to program discontinuation)</td>
<td>Ownership</td>
<td>Date for Action</td>
</tr>
<tr>
<td>5</td>
<td>Regulatory</td>
<td>1 = minimal impact 5 = maximal impact</td>
<td>1 = unlikely 2 = possible 3 = probable 4 = likely 5 = very likely</td>
<td>Enter mitigation plan (Note if the occurrence of the outlined risk leads to program discontinuation)</td>
<td>Ownership</td>
<td>Date for Action</td>
</tr>
</tbody>
</table>
Example of Development Plan
Risk Tree Analysis based on TPP

Candidate Development → Preclinical → Phase I → Phase II → Phase III → Regulatory

Success/P = 0.7 → Success/P = 0.7 → Success/P = 0.7 → Success/P = 0.76 → Stop/P = 0.95 → Stop/P = 0.7 → Stop/P = 0.7 → Success/P = 0.7 → Stop/P = 0.7

Optimistic P = Target P = 1.0 Minimal P =

Path Probability

TBD

SUM

Preclinical

Phase I

Phase II

Phase III

Regulatory

TBD

TBD

TBD

TBD

TBD

TBD

TBD

TBD

TBD
Summary

- **TPPs are excellent tools for:**
  - Planning the development of a novel agent
  - Obtaining accurate and helpful feedback from regulatory agencies
  - Estimating the project risks
  - Evaluating the possibility of success
    - Comparing possibilities of success of other product configurations and indications
  - Evaluating the total costs of development
  - Estimating the market opportunity
  - Retaining focus throughout the development process