Calculating the Direct and Indirect Costs of a Phase III HABP/VABP Clinical Study

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CTTI Hospital-Acquired Bacterial Pneumonia and Ventilator-Associated Bacterial Pneumonia (HABP/VABP) Pilot Study Meeting
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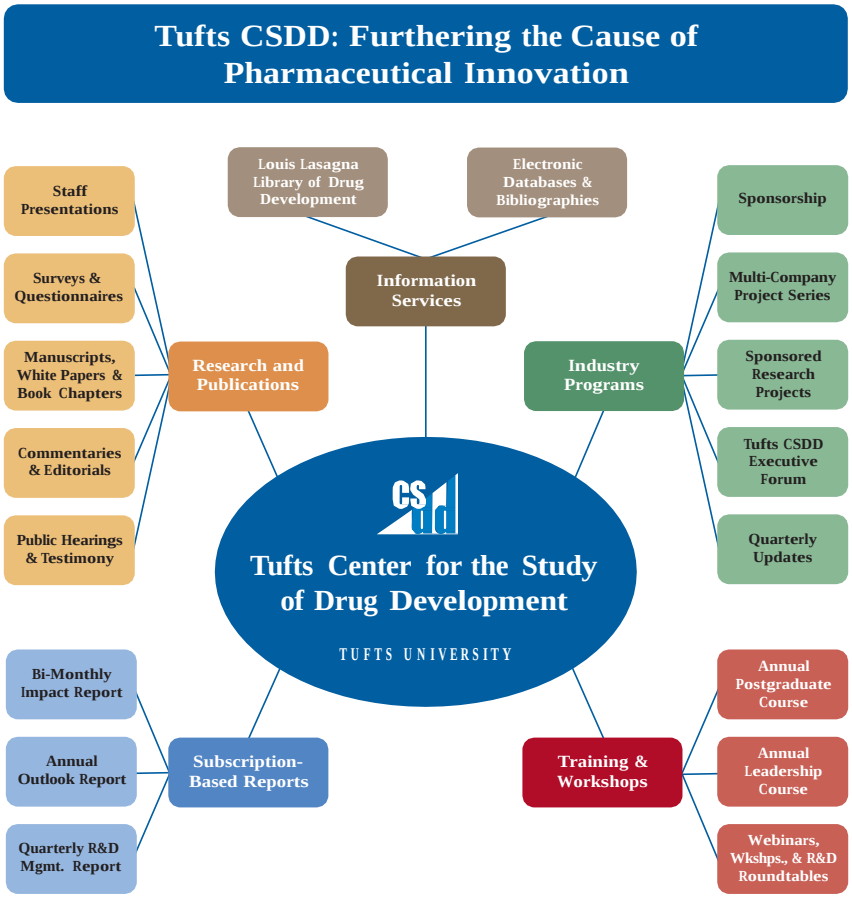
About the Tufts CSDD

- Center at Tufts University School of Medicine (http://csdd.tufts.edu)
- Independent, academic group focusing on drug development scientific, regulatory, economic and management policy
- Grant funded and sponsored studies
- Results have informed Congress, the National Academies of Science, Foundations, Industry, Capital Market analysts and investors, Regulatory Agencies, the National Institutes of Health



CTTI-Tufts CSDD Study Modeling the Cost of a HABP/VABP Phase III trial

- **Study looking to capture and benchmark 'fully-loaded costs' (**direct **and** indirect**) of a typical phase III clinical trial for HABP/VABP***
- **Comprehensive mapping of total cost elements developed**
- **Retrospective cost data gathered and integrated into relational data model**
- **Data elements and model being validated by experts and individuals who have experience with HABP/VABP studies**
- **Model output will provide benchmarks to compare against new and potentially transformative HABP/VABP study designs**

HABP: Hospital Acquired Bacterial Pneumonia; VABP: Ventilator Associated Bacterial Pneumonia

Study Methodology: Three Parts

1. **Comprehensive, detailed mapping of indirect and direct cost elements:**
   - Tufts CSDD faculty and staff expertise
   - Secondary data and literature
   - Data from past HABP/VABP clinical trial protocols
   - Benchmarking tools used to assess clinical trial costs

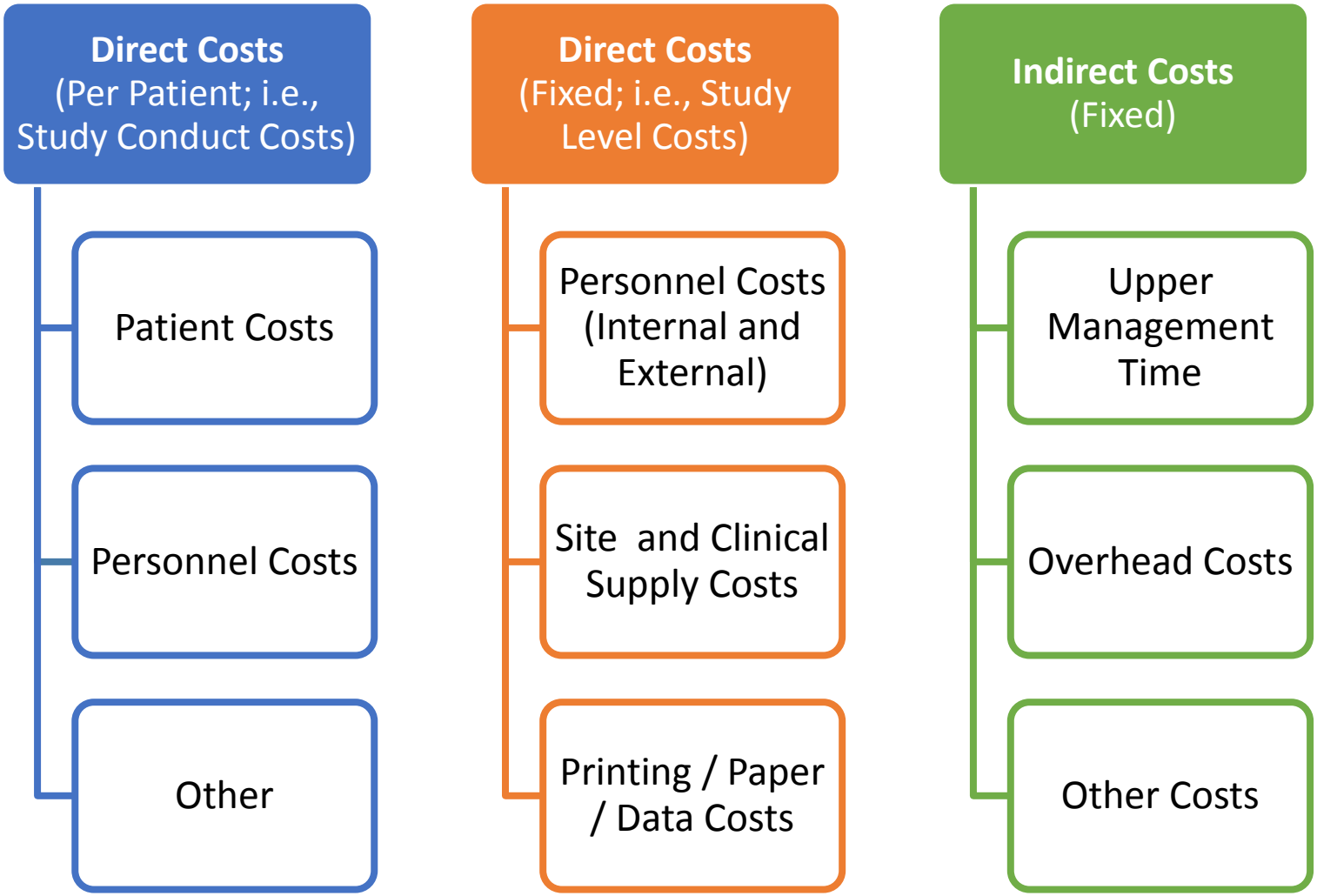
2. **Cost data from:**
   - Internal proprietary databases (resource costs)
     - *Cost data inflation adjusted to reflect 2015 USD*
     - *Cost and resource data based on all therapeutic areas*
   - Commercial sources(e.g., Medidata, Oracle, IRBs, CenterWatch)
   - Assumptions based on completed HAPB/VABP trials listed on Clinicaltrials.gov

3. **Modeling and data validation based on discussions and interviews with experts and members of CTTI Pilot Study**

Project Timeline

Milestone	Timeline
Mapping of Cost Elements	November 2014
Data Gathering	December 2014 – January 2015
Data Modeling	January 2015 – February 2015
Data Validation	**February 2015 – March 2015**
Final Report/Model completion	Mid-March 2015

Determining Fully-Loaded Costs: Primary Cost Elements



Detailed Mapping:

Study Conduct Cost Elements

Patient Costs

- Patient Recruitment Costs
- Patient Retention Costs (i.e. compensation)
- Informed Consent
- Screen Failure Costs
- Cost of procedures
- Cost of lab tests

Personnel Costs (Per Site)

- Primary Investigatory (PI)
- Co-PI
- Research Nurse / Study Coordinator
- Technician
- Other
  - Admin
  - Recruitment Specialist
  - Regulatory Affairs
  - Pharmacist
  - Microbiologist

Other Costs

- Case Report Form
- Recordkeeping / Document Storage
- Data Entry
- Query Resolution
- CGP/ICH Compliance Expenses

Detailed Mapping and Modeling:
Study Conduct Costs and Study Assumptions

Variable	Assumption
Phase, Indication	III; HABP/VABP
Outsourcing Model	Fully outsourced; medium sized providers
Total Sites (all locations)	20 sites
Total Subjects (all locations)	604 subjects (Range: 100 to 1,000 subjects)
Total Number of Countries	3 countries (Range: 1 – 12 countries)

Assumptions represent the mean values for all clinical trials on ClinicalTrials.gov with the following main disease indications:

- *Nosocomial Pneumonia*
- *Bacterial Pneumonia*
- *Infections and Respiratory Infectious*
- *Infection due to resistant bacteria; Pneumonia, Ventilator-Associated*
- *Post-extubation Respiratory Failure*
- *Hospital Acquired Pneumonia*
- *Other*

Looking only at completed, industry sponsored trials that are phase III. Not all trials list total sites and countries.

Mean values based on completed trials; ranges incorporate standard deviations

Detailed Mapping and Modeling:
Study Conduct Costs Site Assumptions

Variable	Assumption
Screen Failure Rate	17%
Subject Drop Rate	9.7%
Source Data Verification	100%

Assumptions based on internal Tufts CSDD databases. They represent mean values for many therapeutic areas.

Detailed Mapping and Modeling:
Subject and Treatment Duration Assumptions

Variable	Assumption
Enrollment Period (i.e. time to find patient; FPI to LPO)	880 Days (~2.4 years)
Treatment Period	3 to 14 days; 8 days in hospital
Test of Cure Visit	21 calendar days from randomization
End of Follow-up Visit	28 calendar days from randomization

Assumptions based on feedback from industry experts.

Detailed Mapping: Study Conduct Costs Personnel Assumptions

Variable	Assumption: Percentage of Time on One Study
Principal Investigator	70%
Co-Investigator	50%
Research Nurse / Study Coordinator Technician Other Administration	25%
Recruitment Specialist Regulatory Affairs Pharmacist / Pharm Tech Project Manager	25%

Assumptions based on feedback from industry experts.

Detailed Mapping: Study Level Cost Elements

Personnel Costs	Site and Clinical Supply Costs	Printing / Paper / Data Costs

• Sponsor: Site Contract Management
• Sponsor: Pharmaceutical Technician
• Sponsor: Product Development
• Clinical Pharmacology
• CRO/Site Contract Management
• Clinical Research Associate
• Physician
• Stat Programmer and Statistician
• Study Manager
• Non-Clinical Research Scientist
	• IRB Feels (Central / Local)
	• Amendment Fees
	• Site Recruitment Costs (marketing)
	• PI Training / Travel Costs
	• Meeting costs for clinical travel team (venue, food, travel)
	• Clinical Supply Costs
	  • Manufacturing
	  • Comparator
		• Investigator Brochure
		  • Printing
		  • Translation
		• Study Protocol
		  • Printing
		  • Translation
		• Informed Consent
		  • Printing
		  • Translation
		• Data Costs
		  • Server charges for EDC
		  • IT Charges for EDC
		  • Storage Costs
		  • Data Entry Costs

Detailed Mapping and Modeling:
Printing / Paper / Data Assumptions

Variable	Assumption
Investigator Brochure	50 Pages
Clinical Trial Protocol	75 Pages
Informed Consent	12 Pages
Number of Copies per site	2 Copies per Site

Assumptions based on feedback from industry experts.

Detailed Mapping and Modeling:
Study Level Cost Assumptions

Variable	Assumption
Number of Attendees (Investigator Meeting)	60 people (3 people / site)
Number of Countries (Investigator Meeting)	1 Country (USA)
Sponsor Personnel Time	• Each FTE's salary converted to hourly rate • Total hours spent phase III study tasks analyzed by TCSDD • Cost per employee determined as total hours spent on a study × hourly rate • Sanity checked using back-of-envelope calculation: $250K per FTE per year × 12 individuals on clinical team (where team is **spending 100% of time on one study**). Percent time indicated on next slide

Detailed Mapping and Modeling:
Sponsor/CRO Personnel Time Assumptions

Resource (One Individual)	Total Months Spent on Phase III Study	Percent Time Spent (In One Year on One study)
Clinical Pharmacology	2.2	100%
Site / Contract Management	7.2	100%
Document Manager	17.8 (~1.5 years)	100%
Clinical Research Associate	160 (5.3 years)	100%
Physician	5.9	70%
Statistical Programmer	11.8 (~1 year)	100%
Statistician	6.4	70%
Study Manager	54.3 (2 years)	100%
Pharmaceutical Technician (clinical supplies)	1.3	100%
Product Development (clinical supplies)	102 (3.4 years)	100%
Non-Clinical Research Scientist	n/a	20%

*Hours (months) reported based on **all** phase III trials. Includes outsourced trials. Percentages from Industry experts.*

Detailed Mapping: Indirect Cost Elements

Upper Management Time	Overhead Costs	Other Costs
• Senior director • Vice President • CMO	• Travel and Meetings • Depreciation (equipment) • Depreciation (buildings) • Other infrastructure costs • Material and office supplies • IT costs	• Administration Costs • Training and Professional Development • Employee Benefits

Detailed Mapping and Modeling:
Indirect Cost Assumptions

- **Upper Management spends ~1% of their time on one clinical study**

- **Overhead costs are small for one clinical trial**

- **Other costs: Administration and Training costs lumped into total cost per FTE: $200K - $250K/ FTE-year.**

Timeline: Model Currently Being Validated

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Thank you

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