

BUSINESS ANALYTICS

Medical Market Segmentation

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innovations
lead the way.

Market Opportunity

Everything is a Multibillion Opportunity

- Market opportunity can be defined in many ways – some lacking value
- Sensationalistic headlines are ubiquitous, but often bereft of context, rationale
- Sophisticated customers will see through “fluff”
- Be prepared to defend your claims with thoughtful, relevant data

“Peripheral Vascular Stents Present Billion-Dollar Opportunity”

“Multi-Billion-Dollar Opportunity – Disc Replacements Will Soon Surpass Fusions as Surgical Solution”

“Global Obesity – The Ballooning Billion Dollar Opportunity for Controlling the Bulge”

“Multi-Billion Dollar Opportunity in Hypertension is Progressing Well”

Market Opportunity

Patients

- Several real-world examples of disease states with significant patient populations
- All valid, useful starting points
- However, topline data are insufficient to truly define most opportunities.

An estimated 5.7M Americans ≥ 20 years of age have Heart Failure

The 2010 worldwide prevalence of AF was estimated at 33.5M

PAD affects ~8.5M Americans

Source: AHA Heart Disease and Stroke Stats, 2015



Market Segmentation

The Importance of Good Market Segmentation

- Indicates your understanding of an addressable target market
- Establishes your credibility
 - Presentation
 - Data sourcing
- Establishes baseline for forecasts and scenario analyses
- Determines basis for marketing and sales plan
- Contributes to the valuation for financings
- A critical first step in building a business plan; requires continuous refinement
- Triangulate from multiple data sources (no data are perfect!)

Market Segmentation

Dimensions

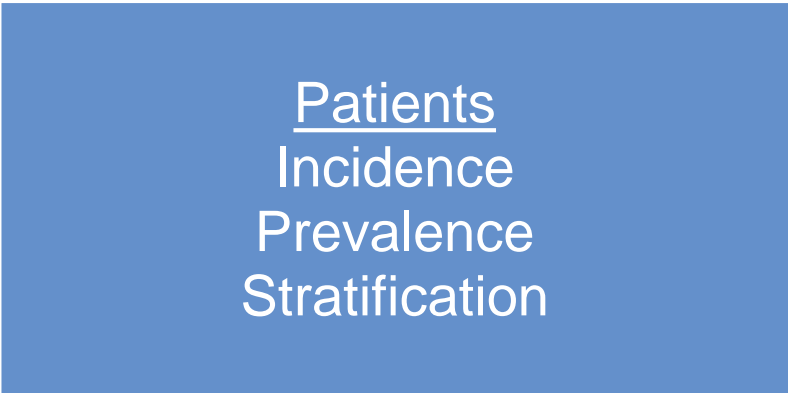
Market
Opportunity

Patients
Incidence
Prevalence
Stratification

MEDICAL MARKET SEGMENTATION

Market Segmentation

Dimensions

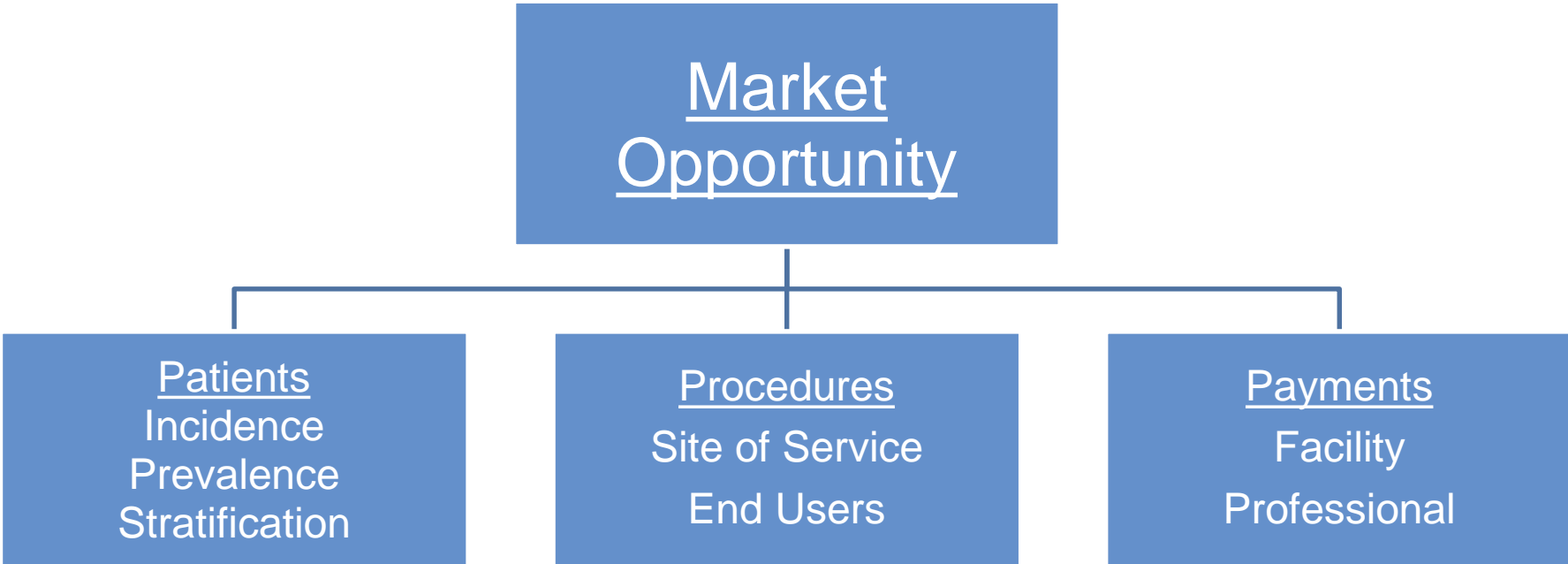


MEDICAL MARKET SEGMENTATION

Market Segmentation

Dimensions

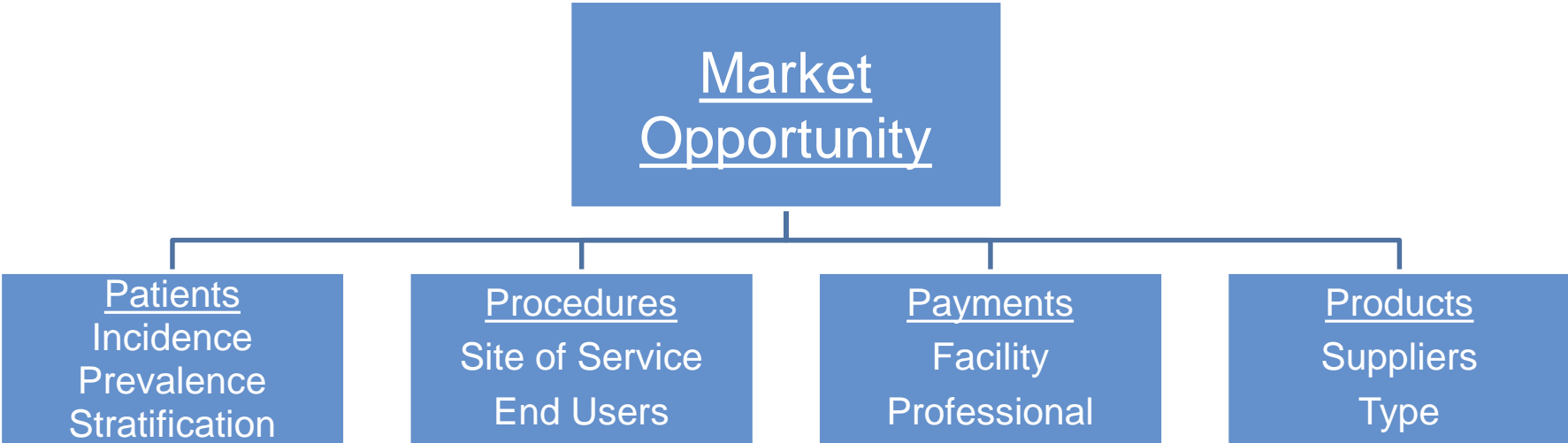
MEDICAL MARKET SEGMENTATION



Market Segmentation

Dimensions

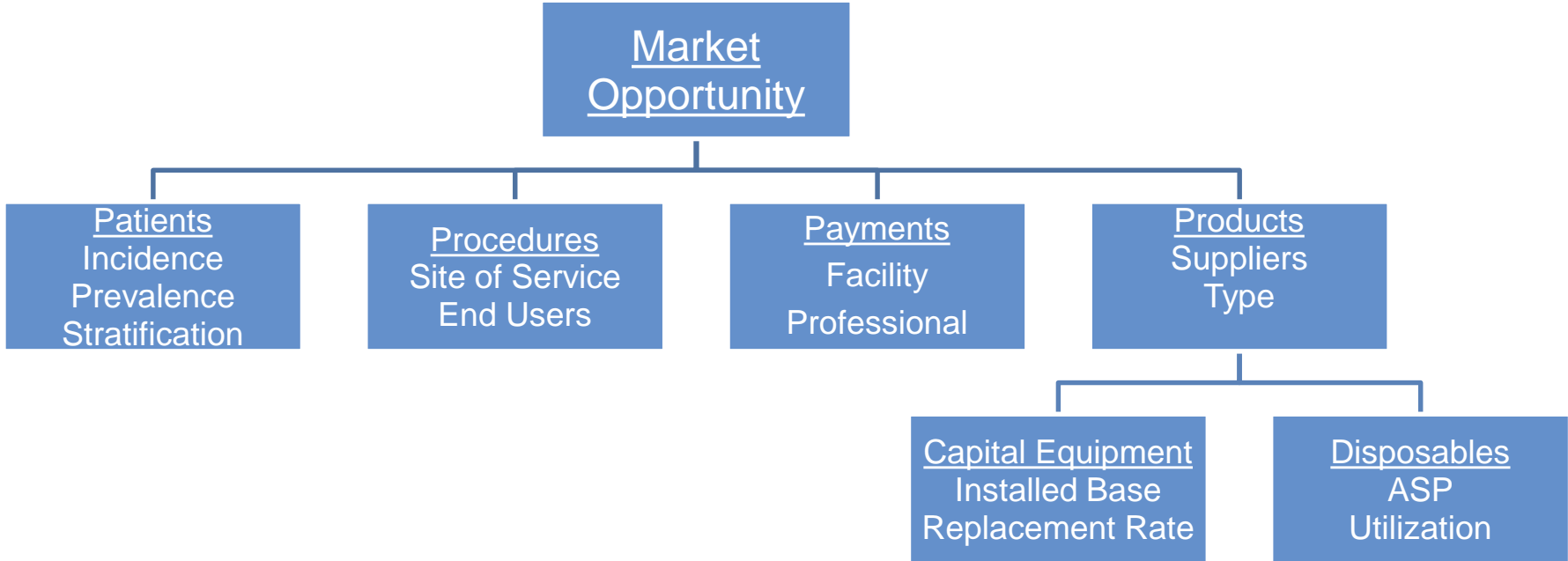
MEDICAL MARKET SEGMENTATION



Market Segmentation

Dimensions

MEDICAL MARKET SEGMENTATION



Market Segmentation

Is Bigger Always Better? The Case for Orphan Drugs

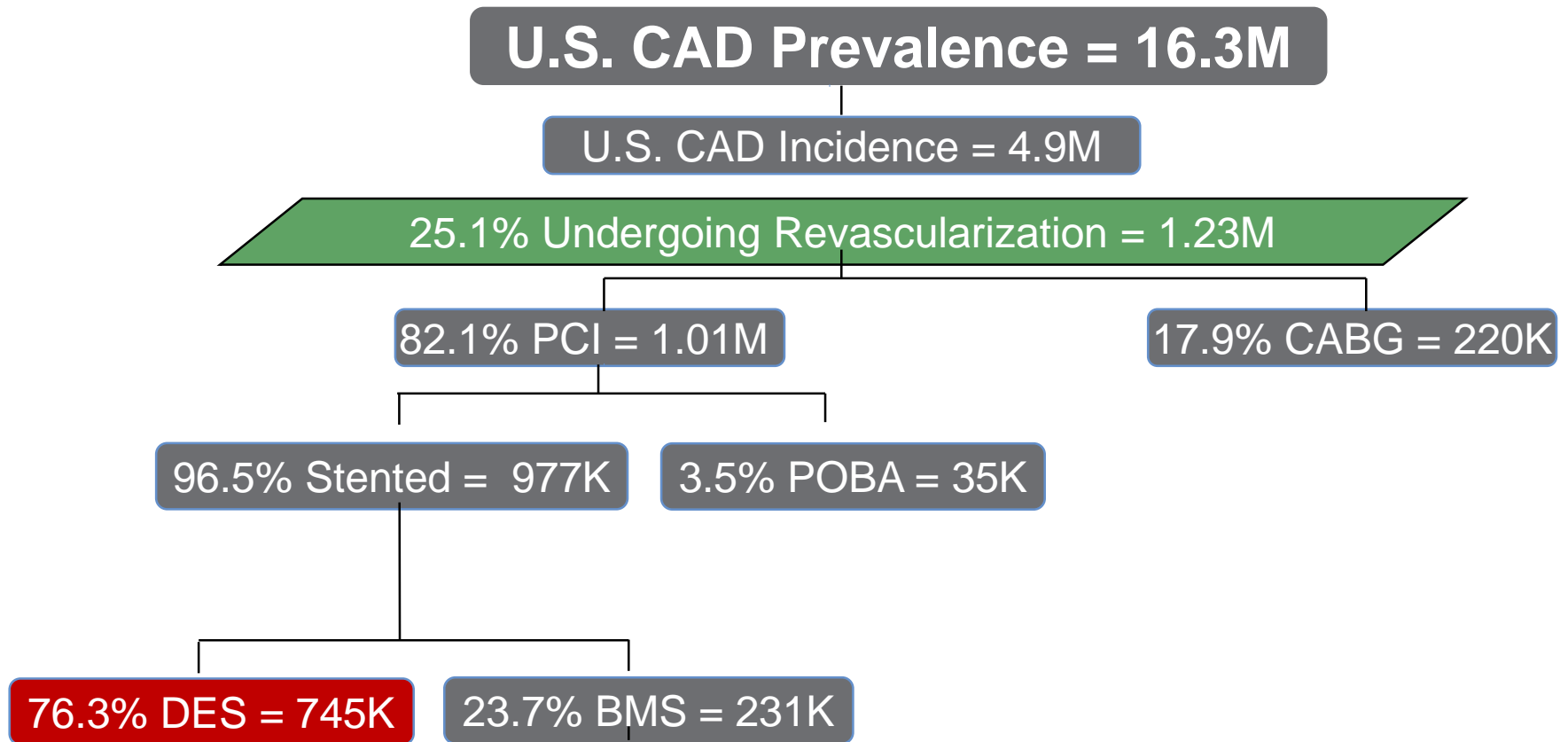
- Rare disease patient populations are defined in law as:
 - USA: <200k patients (<6.37 in 10,000 based on US population of 314M)
 - EU: <5 in 10,000 (<250k patients, based on EU population of 506M)
 - Japan: <50k patients (<4 in 10,000 based on Japan population of 128M)
- Financial incentives by law include:
 - Market exclusivity (USA 7 years from approval, EU 10 years)
 - Reduced R&D costs (R&D tax credits, grants, waived fees)
- Significantly higher pricing and costs per patient per year
 - USA mean cost of \$112k (vs. \$23k for non-orphan drugs)
 - USA median cost of \$66k (vs. <\$5k for non-orphan drugs)
- WW orphan drug sales forecast to grow from ~\$100B in 2015 to reach \$178B by 2020
 - 11.7% CAGR, double overall Rx market growth
 - From 6.1% of WW Rx sales in 2000 to 20.2% in 2020
 - Blockbuster potential: by 2020, top 20 orphan drugs are forecast to generate a minimum of \$2.5B in WW annual revenue, reaching as high as \$12.7B

Source: EvaluatePharma, Orphan Drug Report 2015

Market Segmentation

Segmentation Case Study: Drug Eluting Stents (Top Down)

MEDICAL MARKET SEGMENTATION

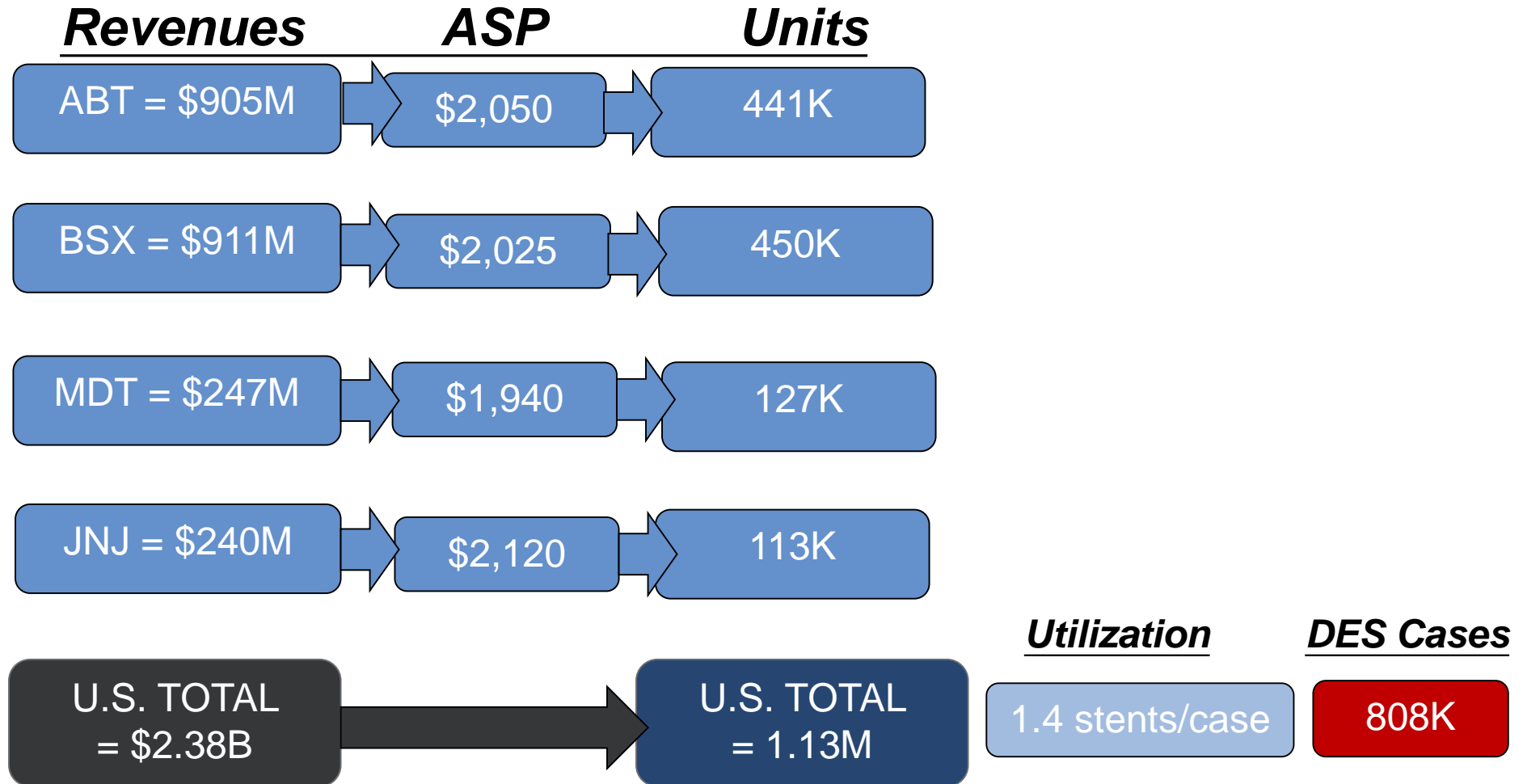


Actual data is outdated, inaccurate and is shown here for example purposes only. Please do not reproduce or use for market modeling!

Market Segmentation

Segmentation Case Study: Drug Eluting Stents (Bottom Up)

MEDICAL MARKET SEGMENTATION



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Market Segmentation

Segmentation Case Study: Osteoporosis

Osteoporosis Remains An Undiagnosed Or Untreated Indication

Illustration, US Osteoporosis (OP) Market

Estimated Prevalence ~ 10M



Source: Amgen October 2014 Business Review Meeting

Source: Cowen and Company

Market Segmentation

Segmentation Case Study: Osteoporosis

U.S. Denosumab Revenue Model For The Treatment Of PMO

	2015A	2016E	2017E	2018E	2019E	2020E
Osteoporosis						
Number of patients with osteoporosis (M)	12.9	13.1	13.3	13.5	13.7	13.9
<i>% growth in number of patients with osteoporosis</i>	<i>1.5%</i>	<i>1.5%</i>	<i>1.5%</i>	<i>1.5%</i>	<i>1.5%</i>	<i>1.5%</i>
Number of patients diagnosed with osteoporosis (M)	9.4	9.6	9.7	9.9	10.0	10.2
Number of patients actively being treated for osteoporosis (M)	6.4	6.5	6.6	6.7	6.8	6.9
<i>% of patients who stop treatment for osteoporosis (M)</i>	<i>11.0%</i>	<i>11.0%</i>	<i>11.0%</i>	<i>11.0%</i>	<i>11.0%</i>	<i>11.0%</i>
Number of patients who stop treatment for osteoporosis (M)	1.0	1.1	1.1	1.1	1.1	1.1
<i>% of patients candidates for denosumab</i>	<i>50%</i>	<i>50%</i>	<i>50%</i>	<i>50%</i>	<i>50%</i>	<i>50%</i>
Number of patients candidates for denosumab (M)	4.2	4.3	4.4	4.4	4.5	4.6
<i>% of patients administered denosumab</i>	<i>9%</i>	<i>10%</i>	<i>11%</i>	<i>11%</i>	<i>11%</i>	<i>11%</i>
Number of patients administered denosumab (M)	0.4	0.4	0.5	0.5	0.5	0.5
Price of denosumab per patient per year	\$1,750	\$1,800	\$1,850	\$1,900	\$1,950	\$2,000
U.S. denosumab sales in osteoporosis (\$MM)	\$700	\$800	\$857	\$914	\$971	\$1,029
<i>Y/Y growth</i>	<i>12%</i>	<i>14%</i>	<i>7%</i>	<i>7%</i>	<i>6%</i>	<i>6%</i>

Source: Cowen and Company

Market Segmentation

Segmentation Case Study: Renal Denervation

in millions	2011	2012E	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
United States										
Population (millions)	313.3	316.4	319.6	322.8	326.0	329.3	332.5	335.9	339.2	342.6
Adult Population	233.5	236.6	239.8	243.0	246.2	249.5	252.9	256.2	259.6	263.1
% of total	74.5%	74.8%	75.0%	75.3%	75.5%	75.8%	76.0%	76.3%	76.5%	76.8%
Hypertension	60.2	62.1	64.0	65.9	67.9	70.0	72.0	74.1	76.3	78.5
% of total	25.8%	26.2%	26.7%	27.1%	27.6%	28.0%	28.5%	28.9%	29.4%	29.8%
Essential HTN	51.2	52.8	54.4	56.0	57.7	59.5	61.2	63.0	64.9	66.7
% of prevalence	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%
Secondary HTN	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.8
Diagnosed	43.2	45.1	46.9	48.9	50.8	52.8	54.8	56.8	58.9	61.0
% of prevalence	84.4%	85.4%	86.3%	87.2%	88.0%	88.8%	89.5%	90.2%	90.8%	91.4%
Medically Treated	39.2	41.1	43.0	45.0	47.0	49.1	51.1	53.3	55.4	57.6
% of prevalence	76.6%	77.9%	79.1%	80.3%	81.4%	82.5%	83.5%	84.5%	85.4%	86.3%
Controlled	28.6	30.3	31.9	33.6	35.4	37.2	39.0	40.9	42.8	44.8
% of Rx treated	73.0%	73.7%	74.2%	74.7%	75.3%	75.8%	76.3%	76.8%	77.3%	77.8%
Uncontrolled	10.6	10.8	11.1	11.4	11.6	11.9	12.1	12.4	12.6	12.8
Stage I	9.0	9.2	9.4	9.7	9.9	10.1	10.3	10.5	10.7	10.9
Stage II	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3
Stage III	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Stage II/III	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	1.9
Anatomical Restrictions	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>0.6</u>	<u>0.6</u>	<u>0.6</u>
Target Population	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3

MEDICAL MARKET SEGMENTATION

Source: J.P. Morgan

Market Segmentation

Segmentation Case Study: Renal Denervation

United States	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Target Population (millions)	1.2	1.2	1.2	1.3	1.3	1.3	1.3
Market Opportunity		\$7,328	\$7,307	\$7,085	\$6,719	\$6,359	\$5,949
Procedure Volume							
Medtronic		12,500	28,500	41,250	54,000	69,750	87,885
Other		0	1,500	13,750	36,000	69,750	107,415
Total		12,500	30,000	55,000	90,000	139,500	195,300
Penetration		1.0%	2.4%	4.3%	6.9%	10.5%	14.5%
Market Shares							
Medtronic		100.0%	95.0%	75.0%	60.0%	50.0%	45.0%
Other			5.0%	25.0%	40.0%	50.0%	55.0%
Pricing							
Average Selling Price		\$6,000	\$5,850	\$5,558	\$5,168	\$4,807	\$4,422
Revenue							
Medtronic		75.0	166.7	229.2	279.1	335.3	388.6
Other		0.0	8.8	76.4	186.1	335.3	475.0
Market Revenue		\$75.0	\$175.5	\$305.7	\$465.2	\$670.5	\$863.6

Source: J.P. Morgan

Market Data

Suggested Resources

Focus	Sources
Patient Data	<ul style="list-style-type: none"> • U.S. Census Bureau • Clinical Literature (PubMed) • Professional Societies (e.g. AHA, ACC, ACS, AAOS)
Procedure & Payment Data	<ul style="list-style-type: none"> • AHRQ/HCUP (National Inpatient Sample, national ER visits) • NCHS (NHDS, NSAS, NAMCS, etc.) • CMS (Medicare Part B Summary Data, Physician Fee Schedule) • IMS (Rx audits) • Truven Health Analytics (all payer claims data) • Manufacturer reimbursement coding guides
Product Data	<ul style="list-style-type: none"> • Public companies (SEC filings, press releases, investor presentations, earnings calls, analyst coverage) • Private companies (D&B/Hoover's, Reference USA, bizjournals.com) • FDA databases (CDER, CDRH) • Syndicated reports from 3rd party market research firms (Informa, BCC Research, Evaluate Pharma, Decision Resources, Frost & Sullivan, GlobalData, GBI Research, iData Research, LifeScience Intelligence) • Equity research reports (individual brokerage firms; Thomson ONE)
Other Sources	<ul style="list-style-type: none"> • American Hospital Association • American Hospital Directory • American Medical Association • Bureau of Labor Statistics • Clinicaltrials.gov

MEDICAL MARKET SEGMENTATION

Takeaways

The Importance of Good Market Segmentation

- Viability of an invention requires an understanding of the *addressable* market
- Defining the addressable market requires an understanding of market *segmentation*
 - Patients
 - Procedures
 - Payments
 - Products