

Predicting Health Care Utilization Over the Decade

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Agenda

Key Trends Affecting Ambulatory Procedure Strategy

Orthopedics and Spine Deep Dive

Ambulatory Trends Across Service Lines

Better Care Management, Surgical Shift to Outpatient Drove Historic Inpatient Decline

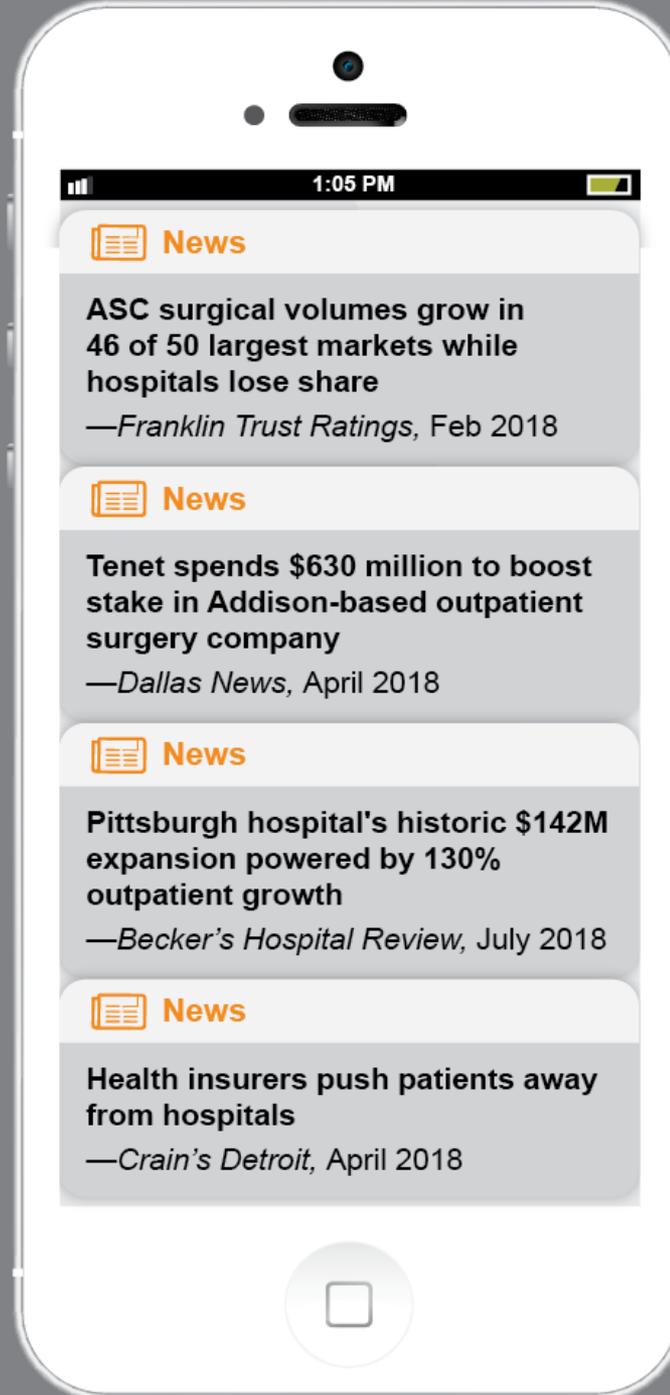
-7%
2008-2014

Historic Inpatient Discharge Volume Trends

2007 2008 2009 2010 2011 2012 2013 2014 2015

Sources: Healthcare Cost and Utilization Project (HCUP). HCUPnet database. Agency for Healthcare Research and Quality. Accessed May 2018; Sg2 Analysis, 2018.

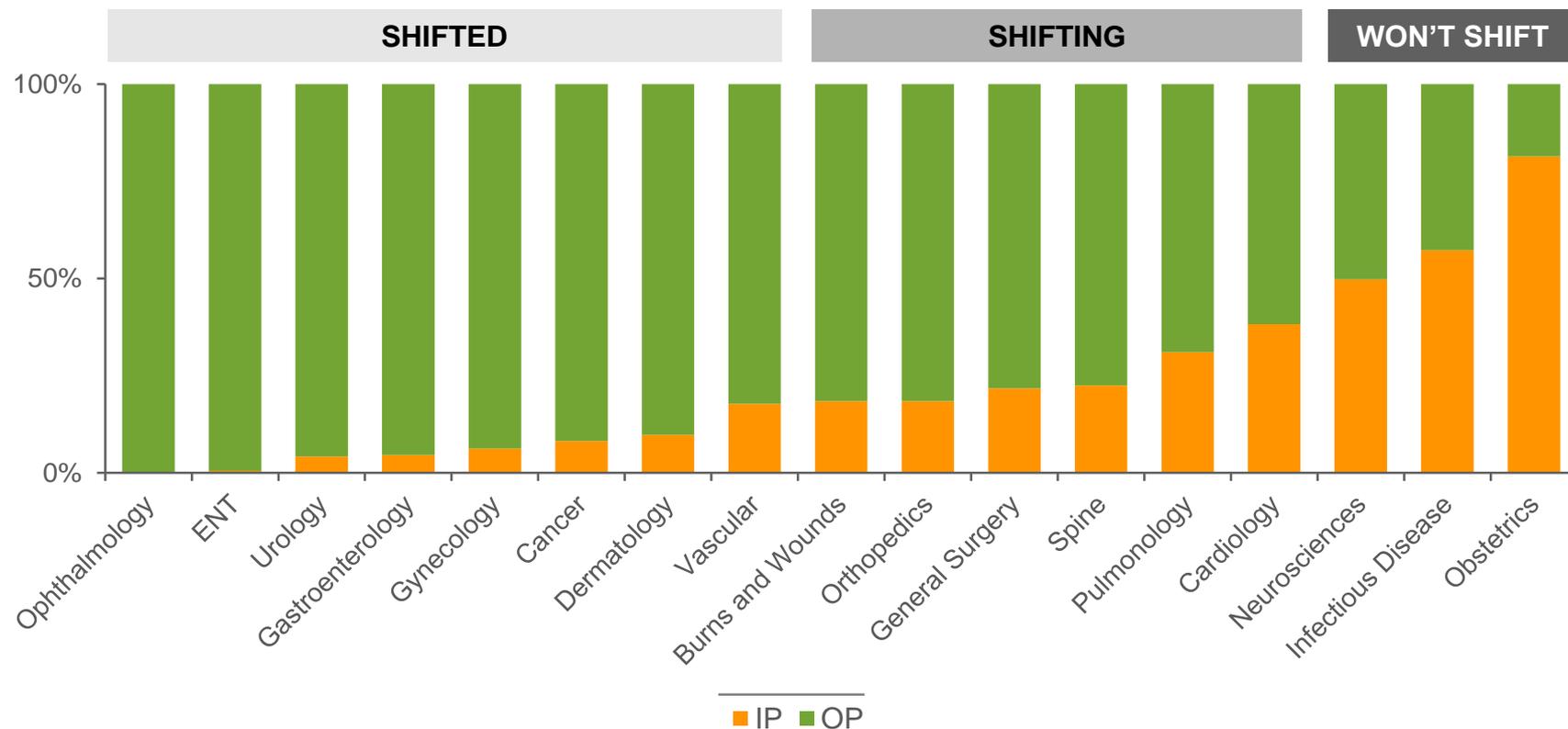
Ambulatory Procedure Growth Shows No Sign of Slowing Down



Most Procedures Across Service Lines Have Shifted or Will Shift to the Outpatient Setting

IP vs OP Procedures

US Market, 2018

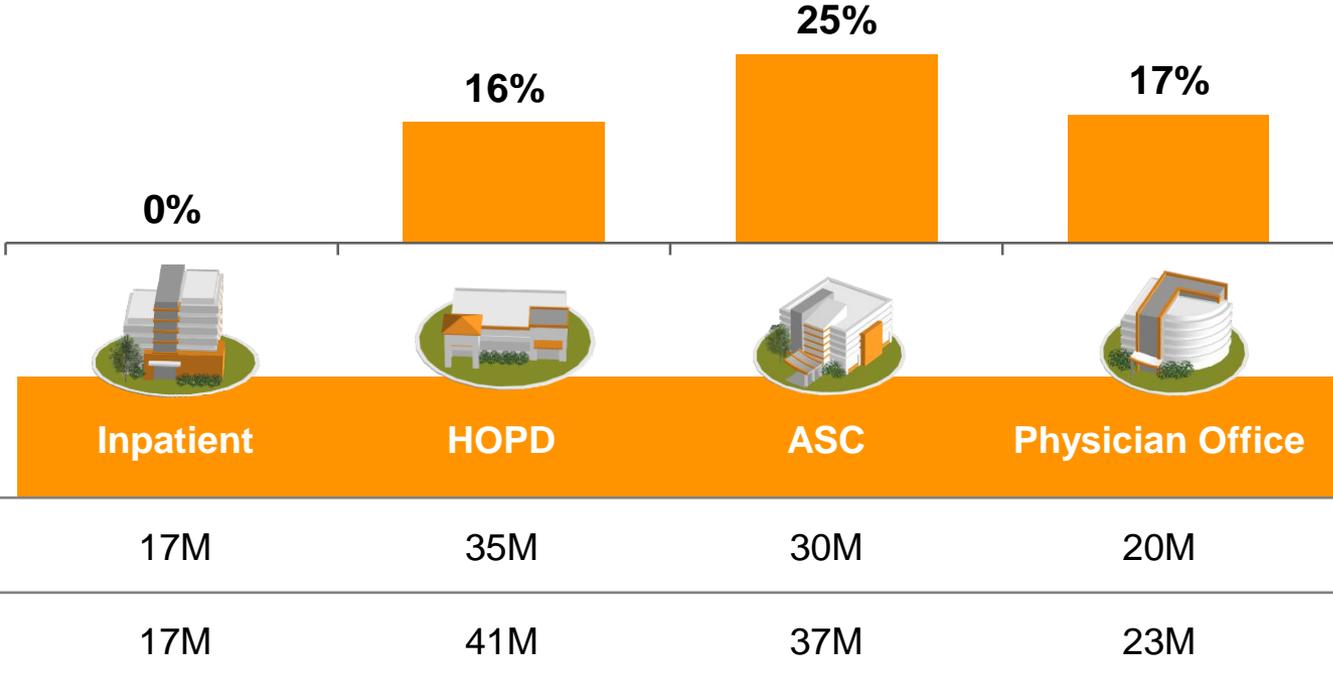


Note: IP procedures defined as all major therapeutic, all minor therapeutic, and diagnostics: brain biopsy and diagnostics: diagnostic catheterization. OP procedures defined as all major procedures, all endoscopy, and diagnostics: diagnostic catheterization. ENT = ear, nose and throat.

Robust Procedure Growth Anticipated Across All Ambulatory Sites

Procedure Forecast by Site of Care

US Market, 2018–2028



Note: IP procedures defined as all major therapeutic, all minor therapeutic, and diagnostics: brain biopsy and diagnostics: diagnostic catheterization. OP procedures defined as all major procedures, all endoscopy, and diagnostics: diagnostic catheterization. HOPD = hospital outpatient department.

Accelerators of Outpatient Shift to Lower-Acuity, Lower-Cost Settings Dominate Braking Mechanisms

Brakes

- Physician employment
- Physician logistics/practice patterns (physicians reluctant to split time between hospital and another site)
- Rising patient acuity across all sites
- High cost of equipment and technology needed for some procedures
- Low number of ASCs in market
- State regulatory climate unfavorable to ASCs

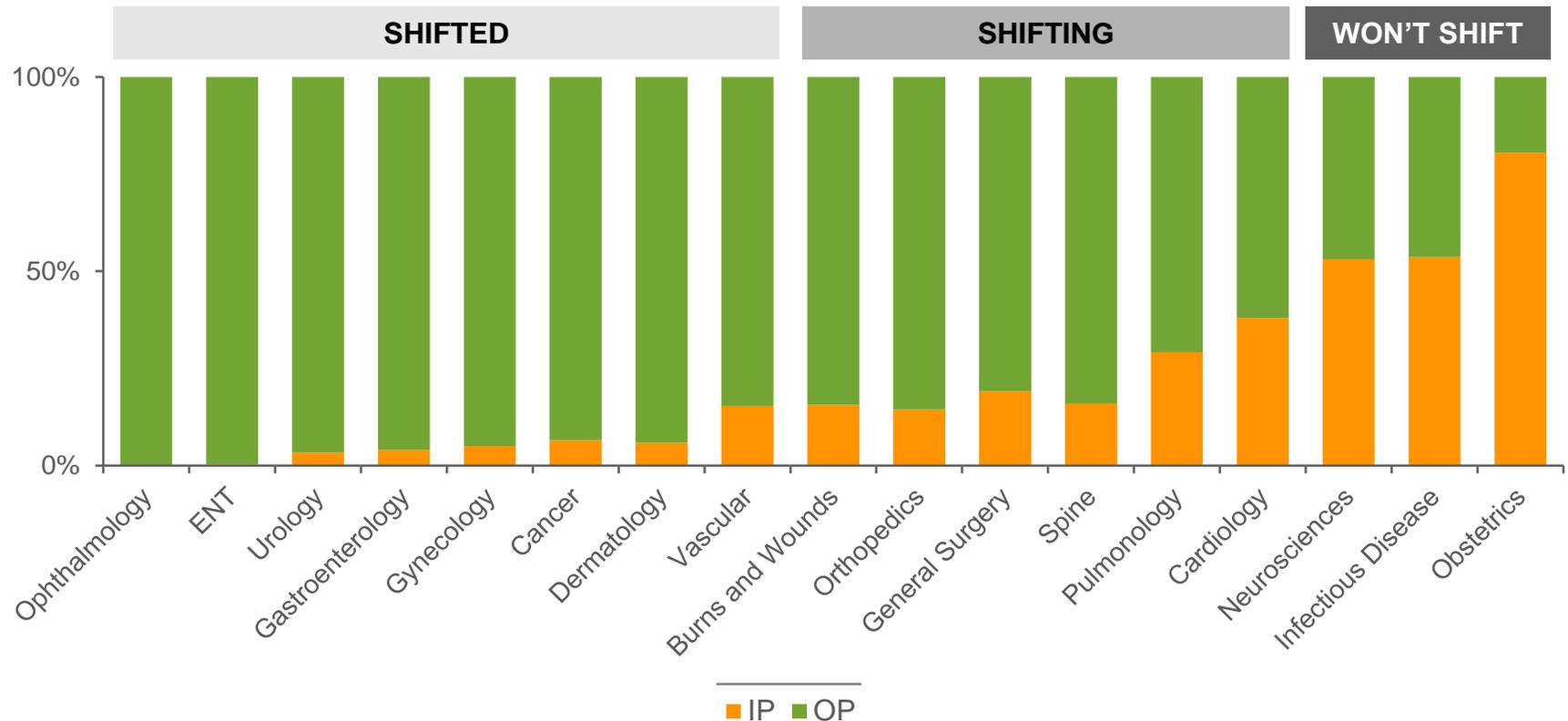
Accelerators

- Physician ownership of ASCs in market; physician entrepreneurship; physician control
- Growing physician experience/comfort with clinical/technologic advances
- Pressure from payers, employers to move procedures to lower-cost sites
- Consumerism, patient convenience
- ASC evolution (eg, venture capital investment, payers buying ASC companies)
- High number of ASCs in market
- Current federal administration pushing competition and lower-cost settings
- State regulatory climate favorable to ASCs

By 2028, 85% of Procedures Will Be Performed in the Outpatient Setting

IP vs OP Procedures

US Market, 2028 (Projected)



Note: IP procedures defined as all major therapeutic, all minor therapeutic, and diagnostics: brain biopsy and diagnostics: diagnostic catheterization. OP procedures defined as all major procedures, all endoscopy, and diagnostics: diagnostic catheterization.

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Procedure Strategy

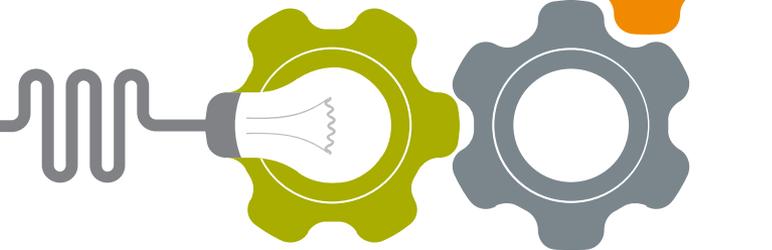
Orthopedics and Spine Deep Dive

Ambulatory Trends Across Service Lines

Disruption, Innovation Dominate the Orthopedic and Spine Landscapes

Sg2's Top Disruptive Trends in Orthopedics and Spine 2018

- ▶ Outpatient shift accelerates.
- ▶ Ortho and spine growth remain strong.
- ▶ Bundled payment TJR success drives alternative payment expansion.
- ▶ Efforts for ASC partnerships and physician alignment models continue.
- ▶ Ortho urgent care centers, alternative care pathways for spine care address patient access and value.
- ▶ Declining reimbursement reinvigorates cost efficiency evaluation in joint replacement, spine surgery.

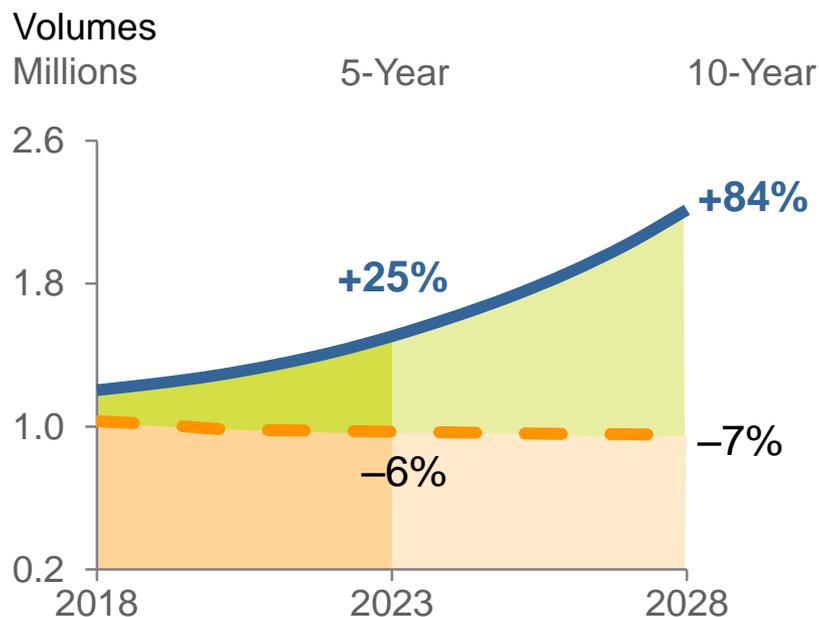


TJR = total joint replacement.

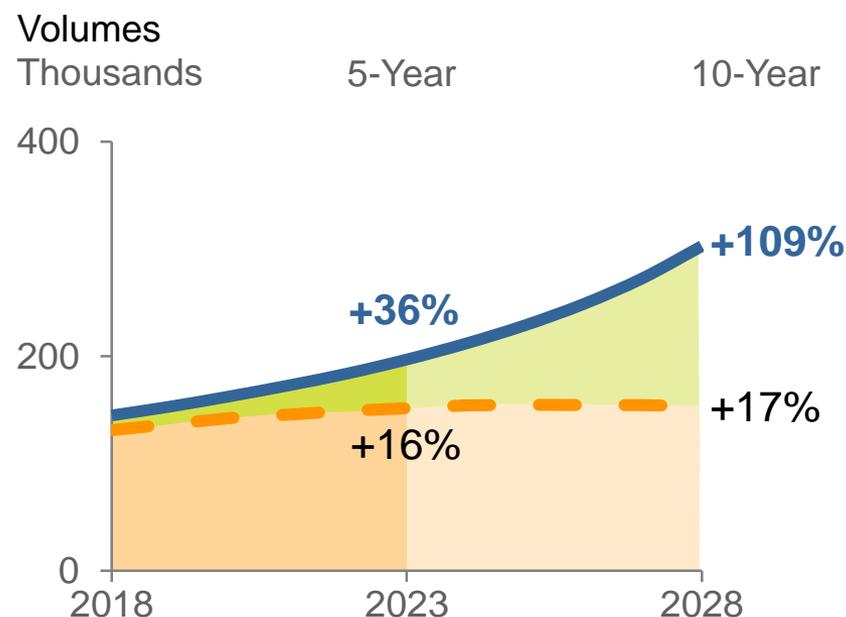
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Joint Replacement Growth Will Be in the Outpatient Setting

IP and OP Hip and Knee Replacement Forecast, US Market, 2018–2028



IP and OP Shoulder Replacement Forecast, US Market, 2018–2028

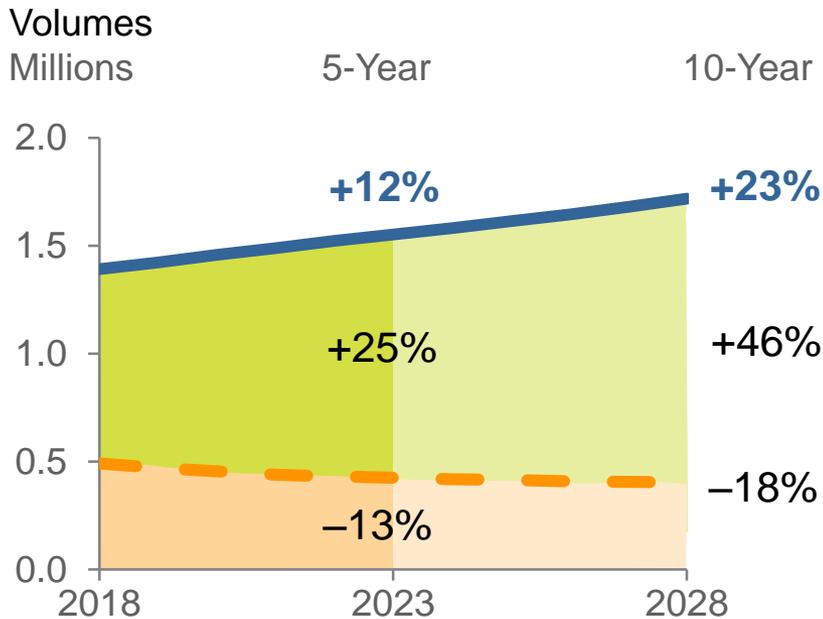


■ Sg2 IP and OP Forecast ■ Sg2 IP Forecast ■ Sg2 OP Forecast

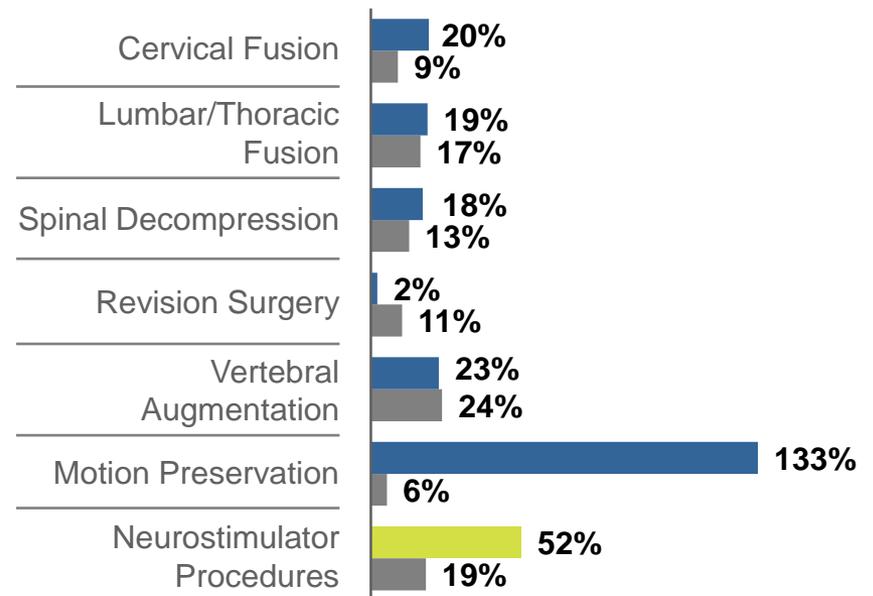
Note: Analysis excludes 0–17 age group. Hip and knee replacement includes primary and revision hip/knee replacement and partial knee replacement for Osteoarthritis CARE Family only. Shoulder replacement includes all orthopedic CARE Families. **Sources:** Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Surgical Spine Growth Is Strong

Surgical Spine Forecast IP and OP, US Market, 2018–2028



Surgical Spine Procedure Forecast IP and OP, US Market, 2018–2028



■ Sg2 IP & OP Forecast ■ Sg2 IP Forecast ■ Sg2 OP Forecast ■ Population-Based Forecast

Note: Analysis excludes 0–17 age group and includes the spine service line. Sg2 IP and OP Forecast includes IP Major Therapeutic procedure group and OP Major Procedures procedure group but excludes radiofrequency ablation. **Sources:** Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Orthopedics/Spine Top Outpatient Growth for Surgical Procedures

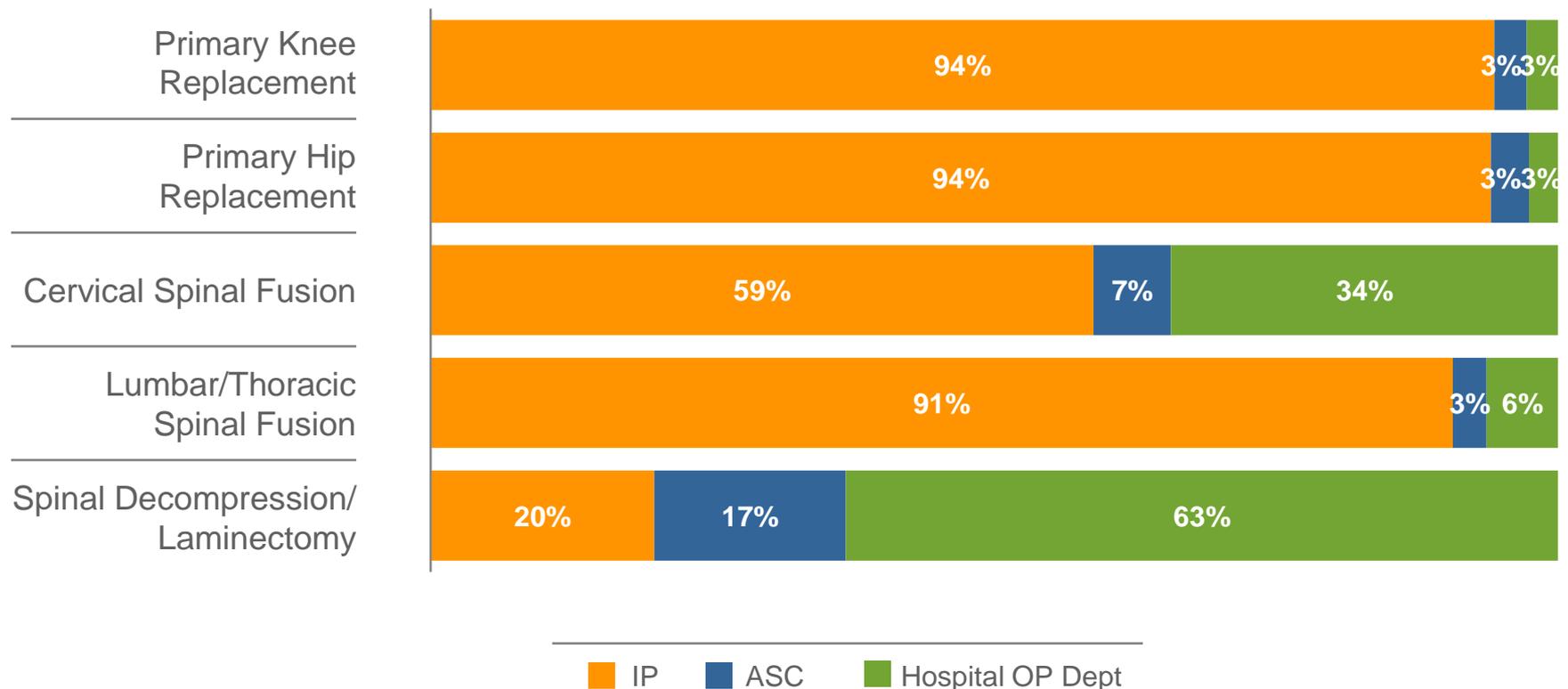
	10-YEAR % CHANGE	2018 VOLUMES
Overall Surgeries	23%	40,658,000
Primary Knee Replacement	1,105%	61,000
Primary Shoulder Replacement	971%	14,000
Primary Hip Replacement	712%	43,000
Lumbar/Thoracic Spinal Fusion	211%	31,000
Motion Preservation Procedures	153%	15,000
Partial Knee Replacement	139%	77,000
Revision Knee Replacement	120%	4,000
Primary Ankle Replacement	110%	2,000
Cervical Spinal Fusion	90%	103,000
Prostatectomy	62%	12,000
Intracardiac Catheter Ablation	51%	236,000
Arthroscopy	35%	3,557,000
Neurostimulator Procedure	30%	448,000

Note: Forecast excludes 0–17 age group. OP surgery is defined as procedures: major and endoscopy: arthroscopy.

Sources: Impact of Change®, 2018; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Majority of Ortho and Spine Procedures Are Performed in the Hospital Today

2018 Procedure Location Mix

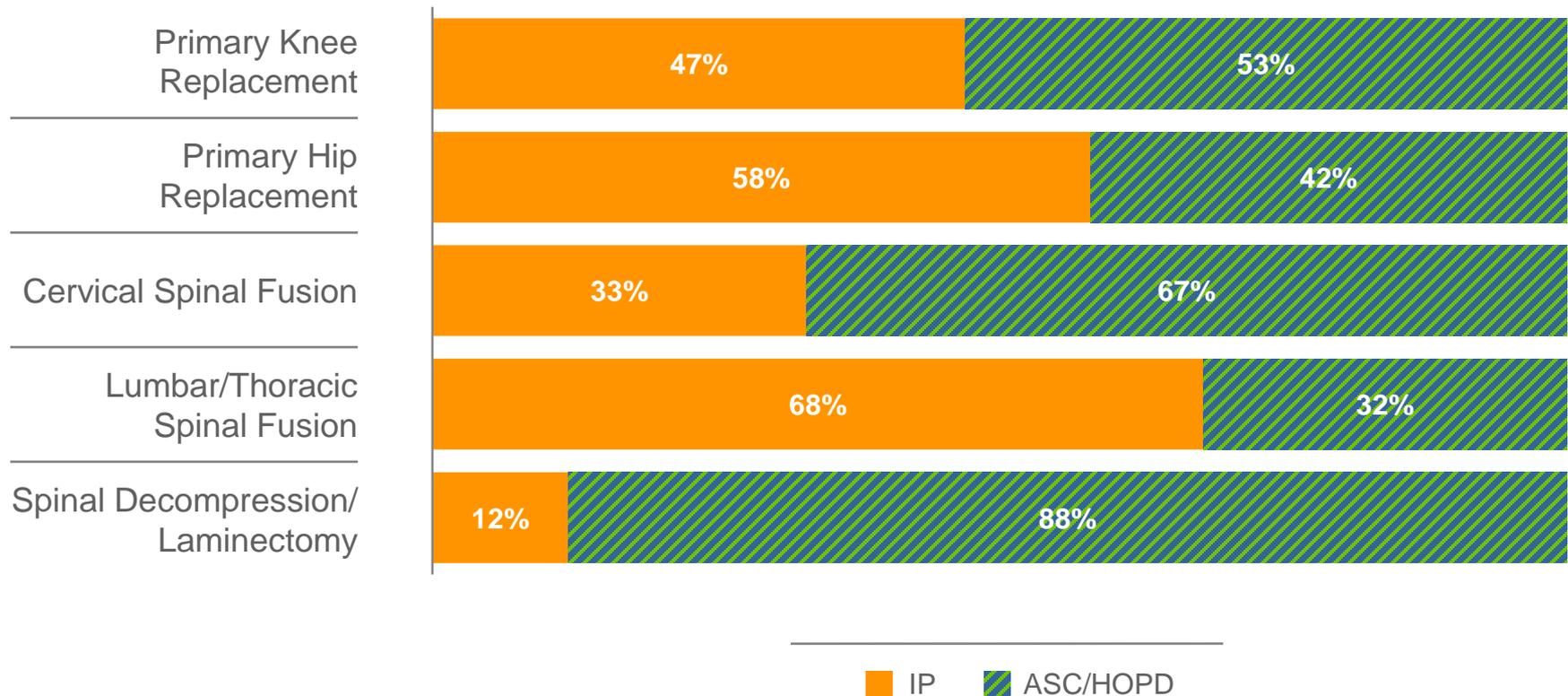


Note: Analysis excludes 0–17 age group. Dept = department.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Ortho and Spine Procedures Primed for Outpatient Shift

2028 Forecasted Procedure Breakout

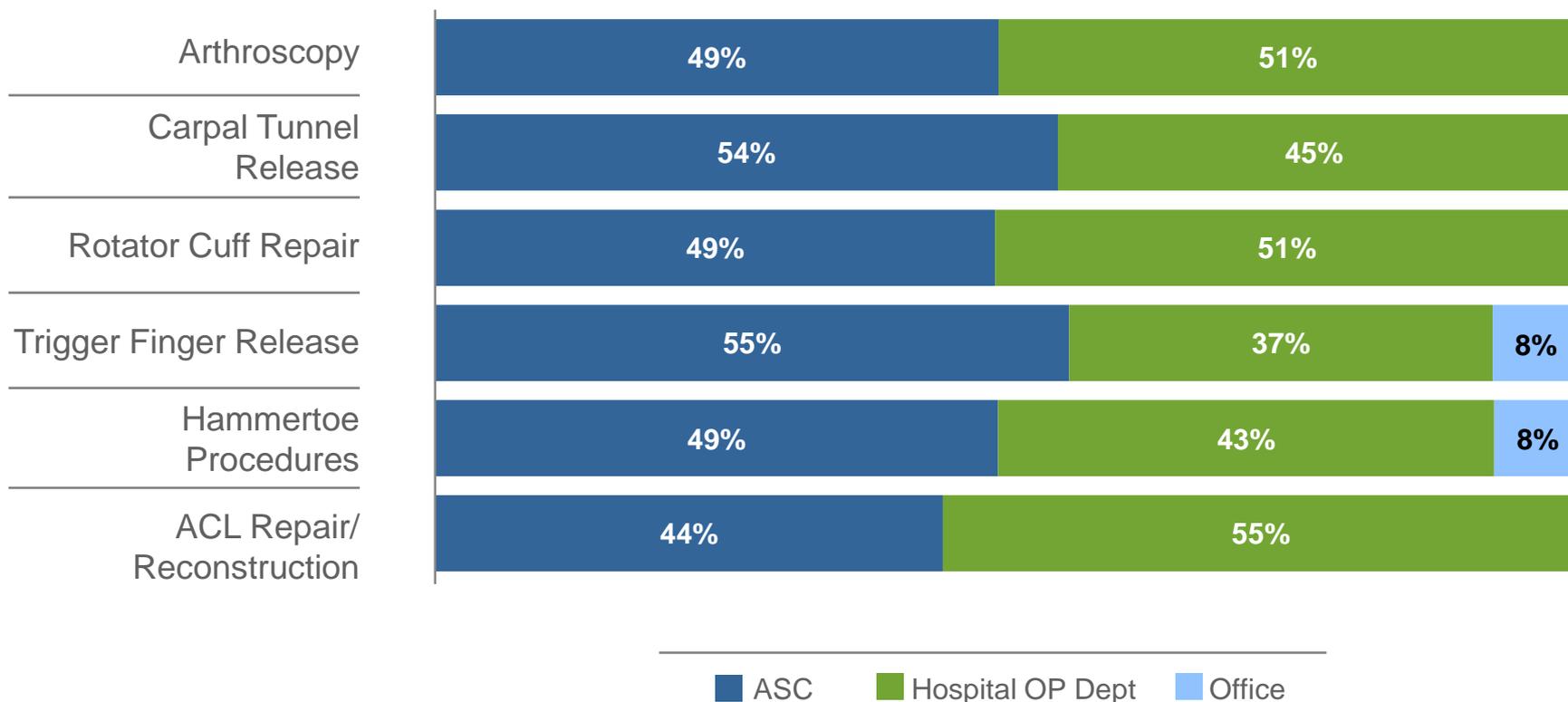


Note: Analysis excludes 0–17 age group.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Today's Ambulatory Procedures Are Split Roughly 50/50 Between HOPD and ASC

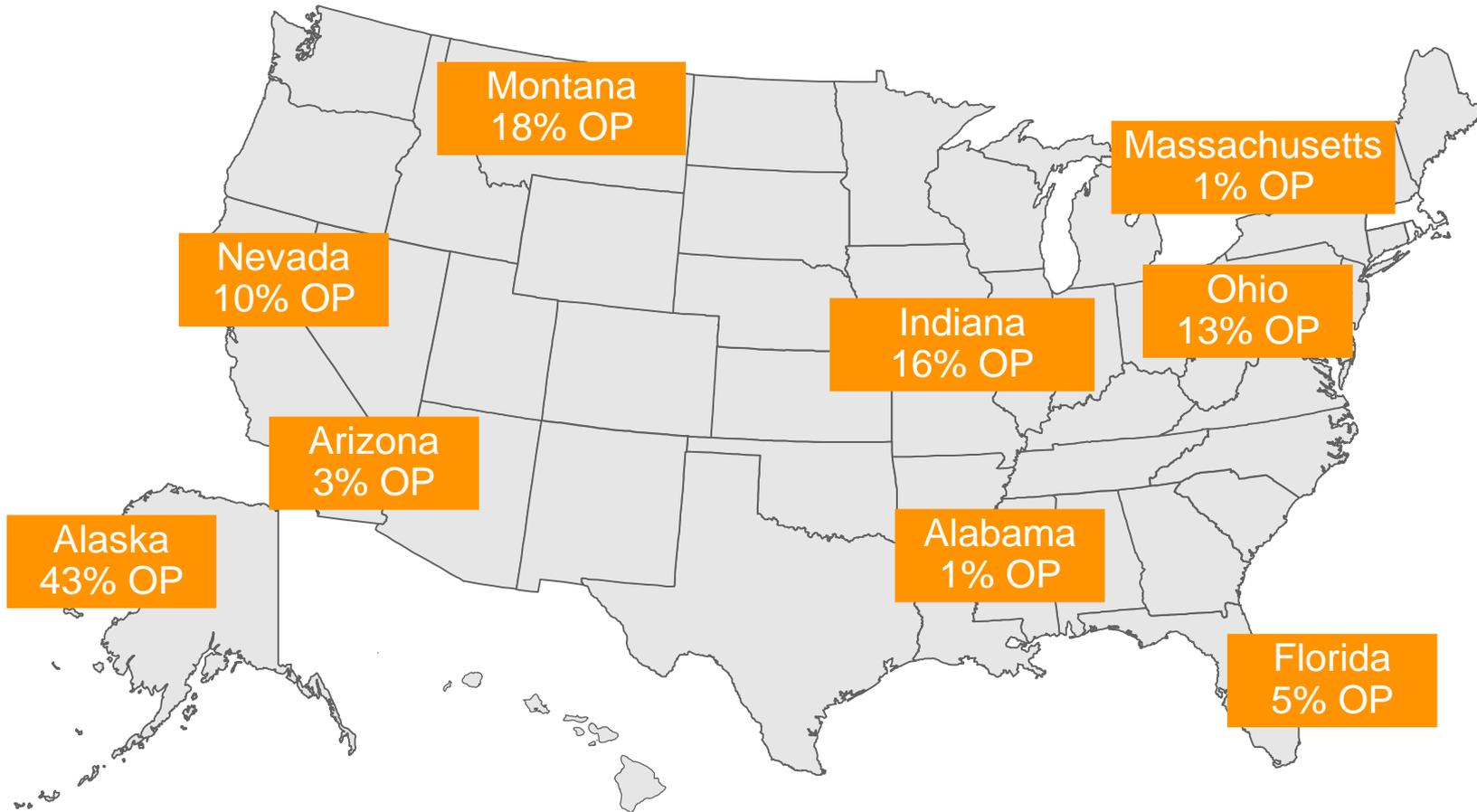
2018 Procedure Location Mix



Note: Analysis excludes 0–17 age group. Percentages that do not add to 100% are due to rounding.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

OP TJR Adoption Varies Substantially by Region



Sources: Health Intelligence Company, LLC; OptumInsight; Healthcare Data Solutions; Sg2 Analysis, 2017.

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UNITYPOINT HEALTH—TRINITY, BETTENDORF, IA



- Surgeon-driven movement
- Consistent ASC and hospital experience
- Hospital alignment and ASC buy-in
- Focus on the patient and quality
- Aggressive contracting
- Expansion

Primary hip and knee replacement volumes are expected to grow

84%

over the next decade

2013–2017 Growth



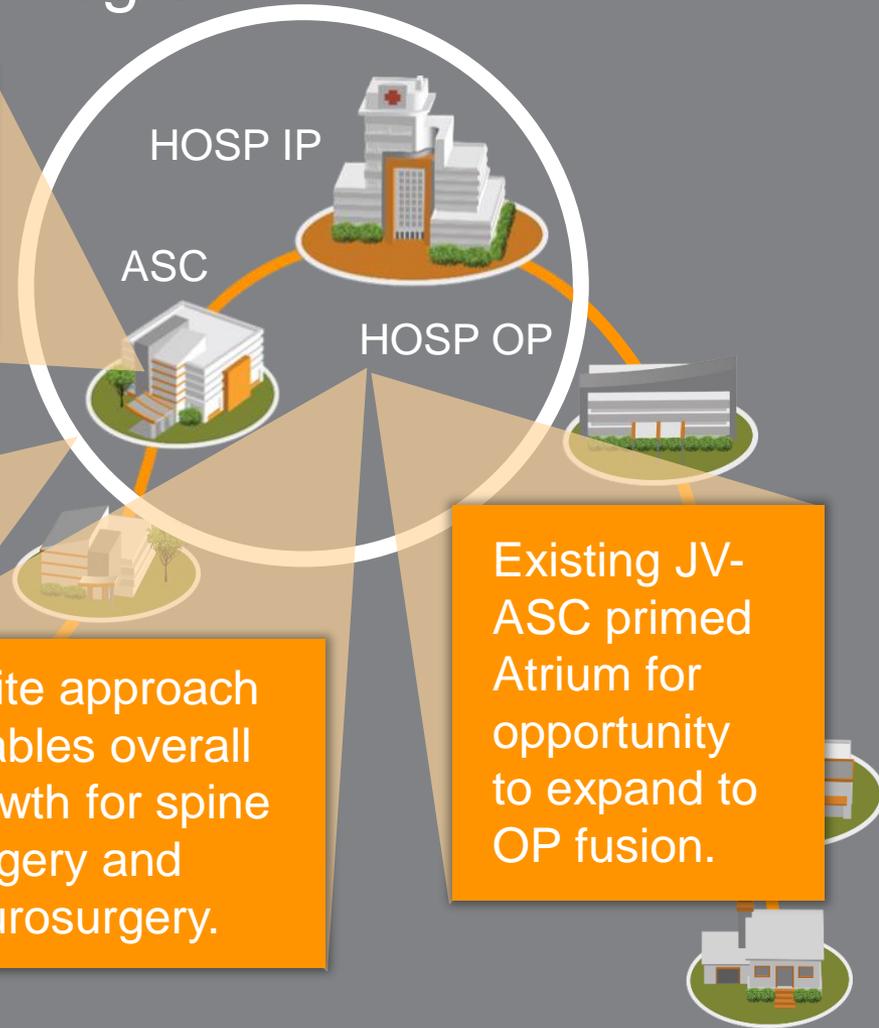
Surgery Center	178%
Hospital	41%
Total Program	69%

CASE STUDY

High-Quality Focus Across the System of CARE Differentiates Program

ASC joint venture between Atrium and Carolina Neurosurgery & Spine Associates

23-hour stay enables transition of select cases to ASC.



High-quality, efficient care continuum positions Atrium for success in national employer bundles.

3-site approach enables overall growth for spine surgery and neurosurgery.

Existing JV-ASC primed Atrium for opportunity to expand to OP fusion.

Note: Atrium Health was formerly Carolinas HealthCare System. JV = joint venture.

Source: Sg2 Interview With Atrium Health, 2018.

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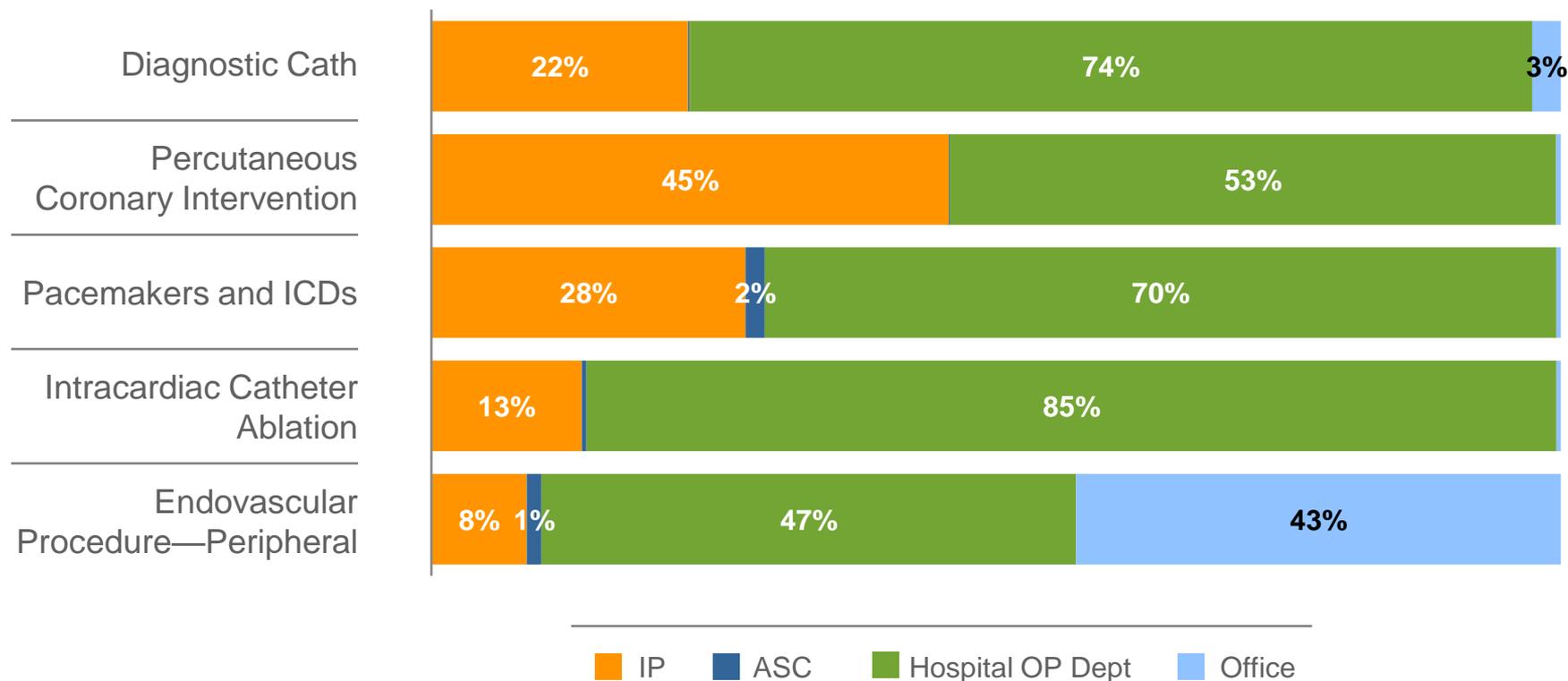
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**Ambulatory Trends Across Service
Lines**

CV Procedures Have Gained a Strong Foothold in the Outpatient Setting

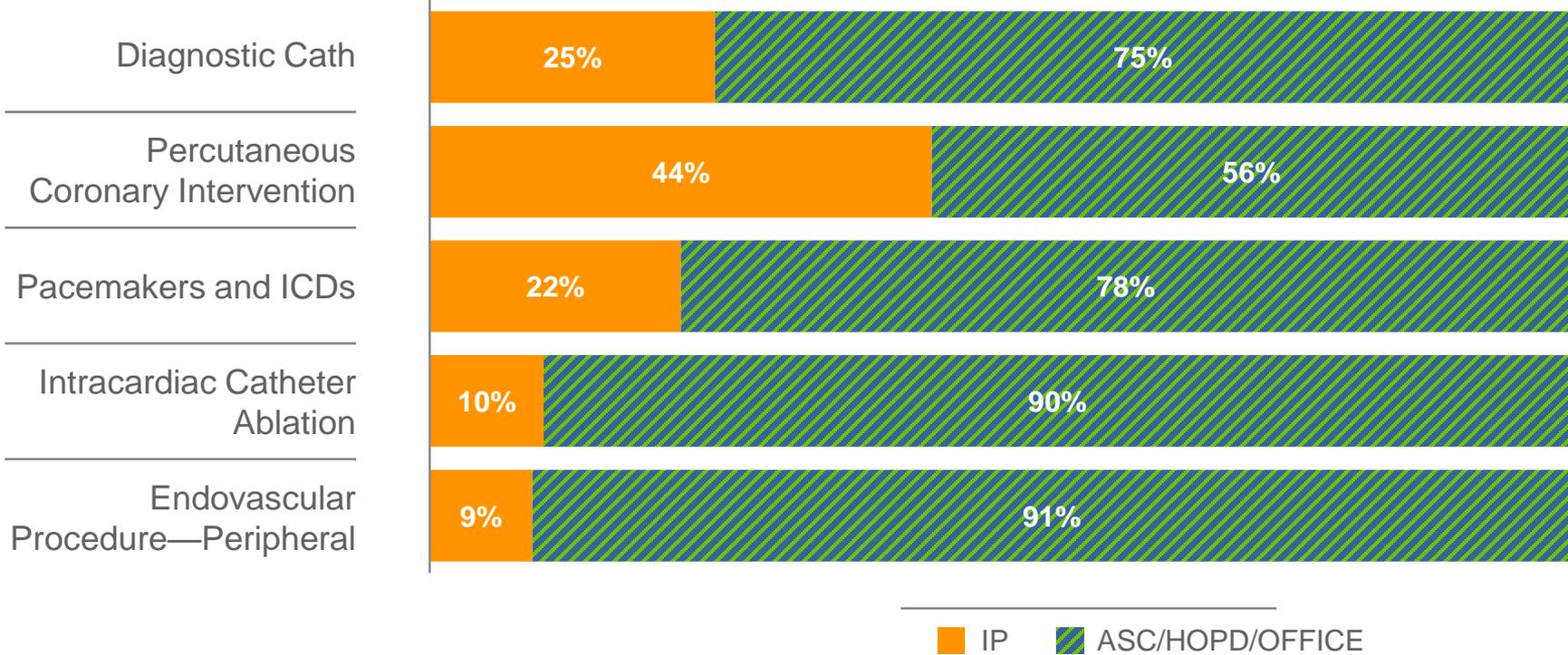
2018 Procedure Location Mix



Note: Analysis excludes 0–17 age group. Percentages that do not add to 100% are due to rounding. Cath = catheterization; ICD = implantable cardioverter defibrillator.
Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Over 80% of CV Procedures Will Be Performed Outpatient by 2028

2028 Forecasted Procedure Breakout

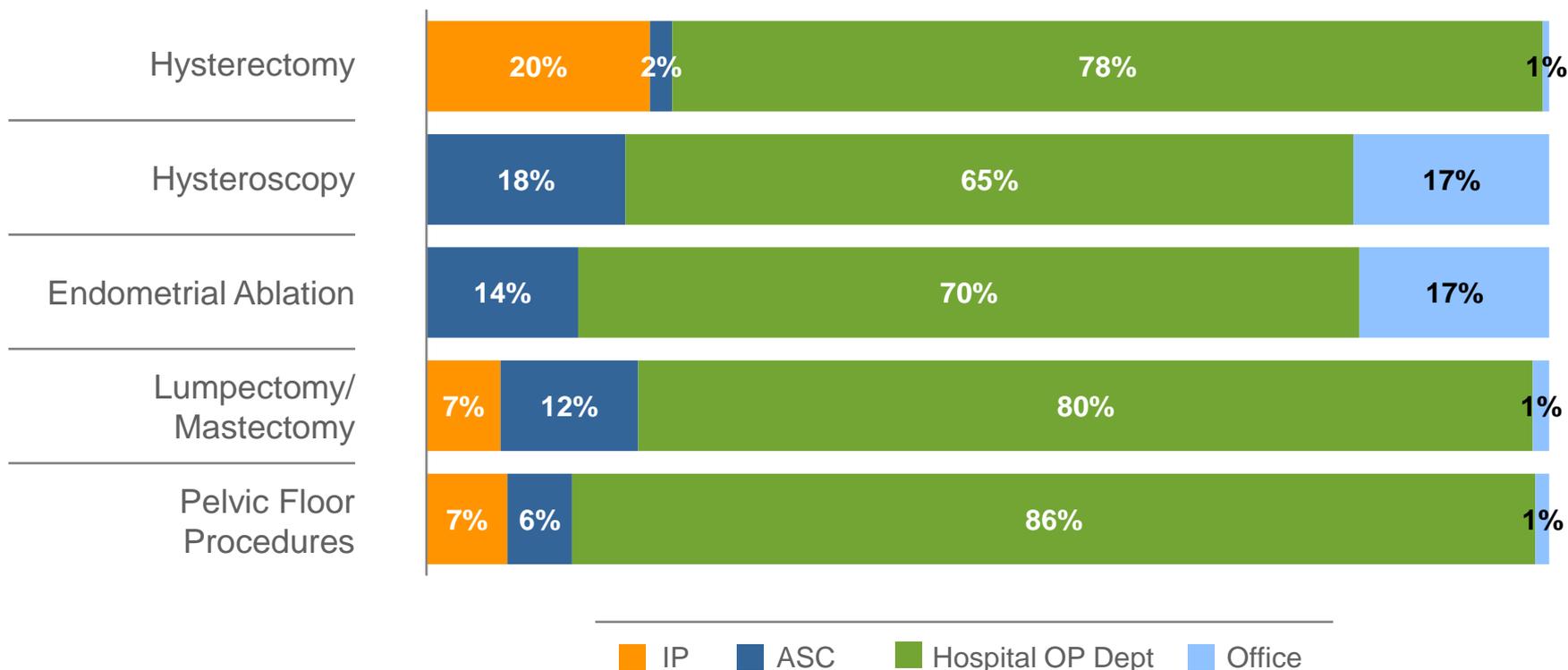


Note: Analysis excludes 0–17 age group.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Women's Health Procedures Are Performed Primarily in Hospital OP Department Today

2018 Procedure Location Mix

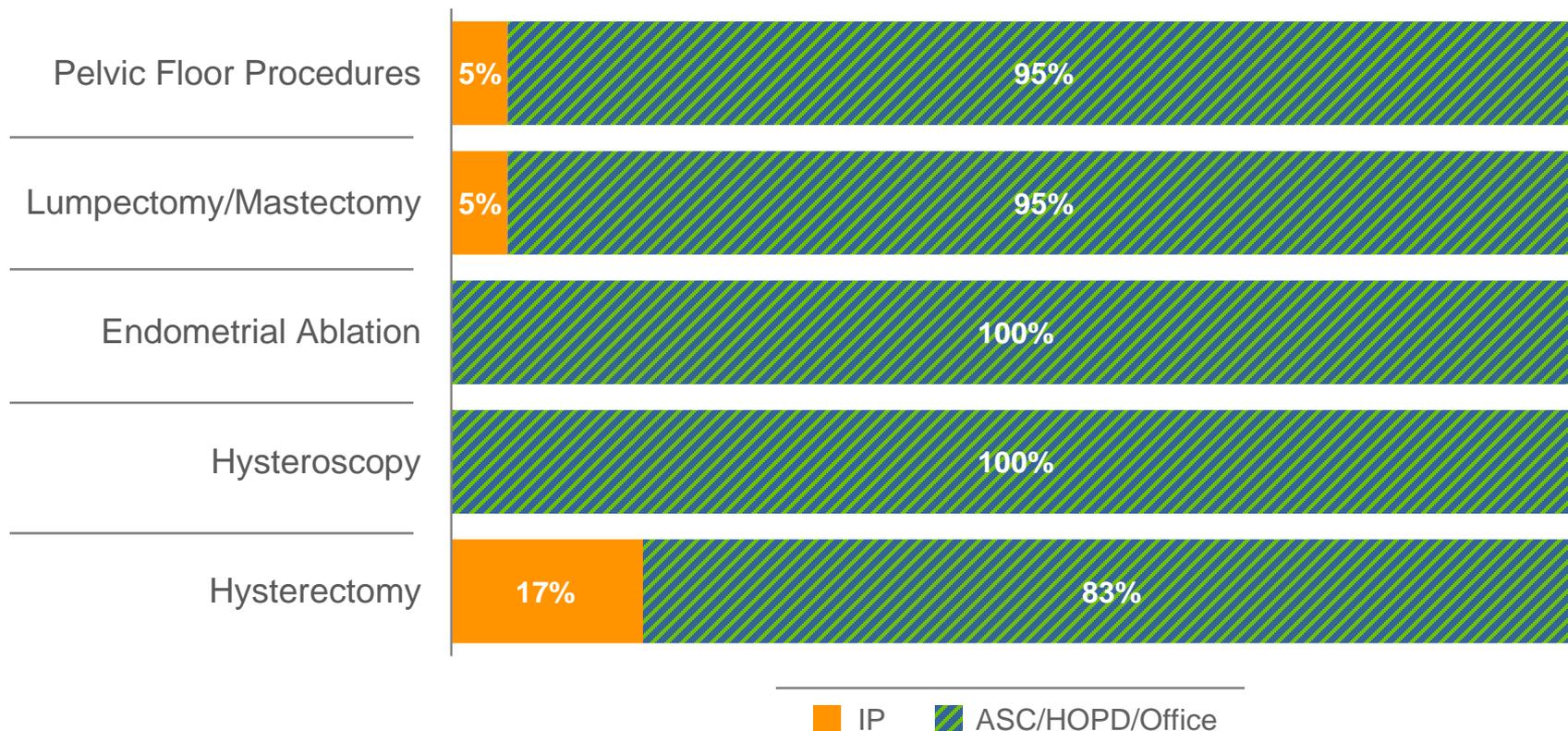


Note: Analysis excludes 0–17 age group. Percentages that do not add to 100% are due to rounding.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

Physician Specialization Will Enable Shift of Procedures to ASC and Office Setting

2028 Forecasted Procedure Breakout

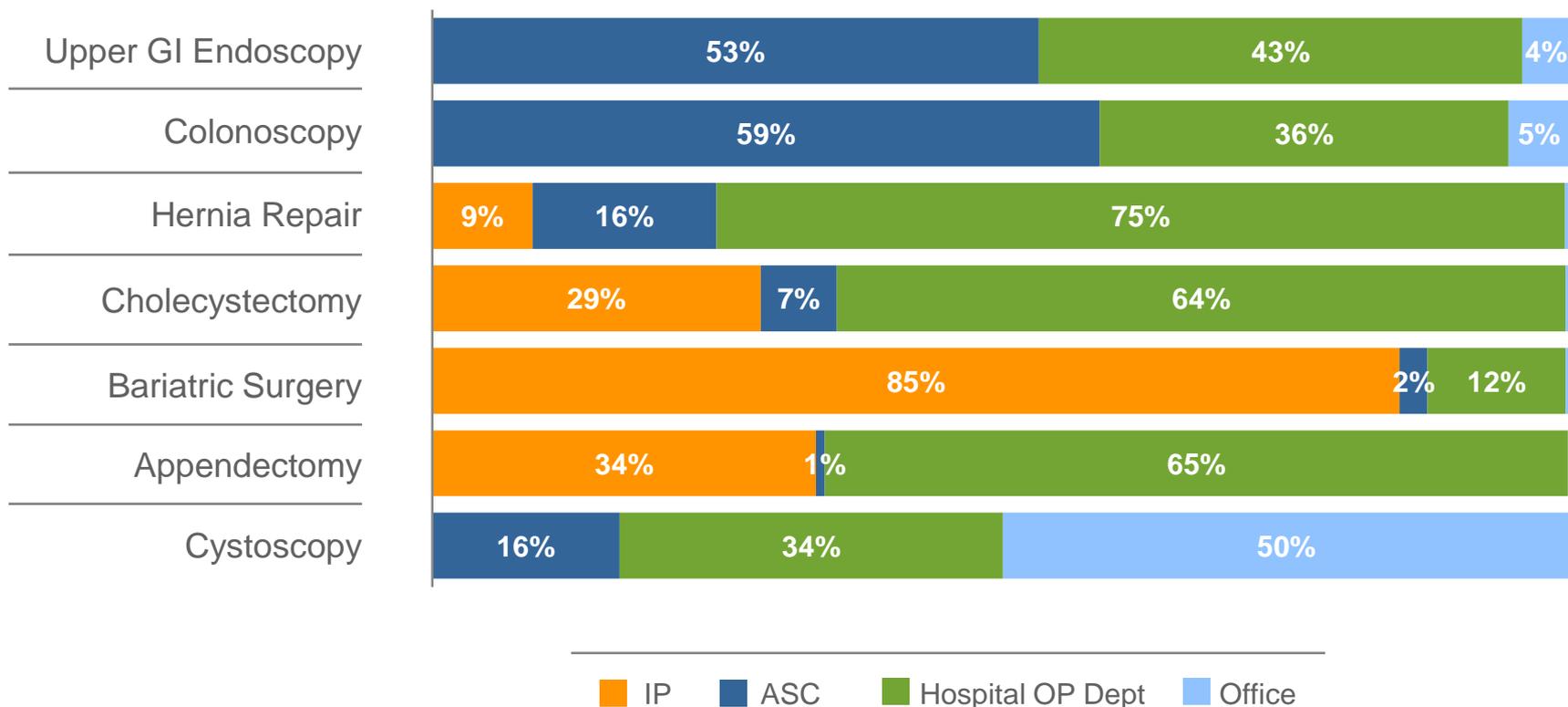


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Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

GI, Urology and General Surgery Procedures Dominate the ASC Setting

2018 Procedure Location Mix



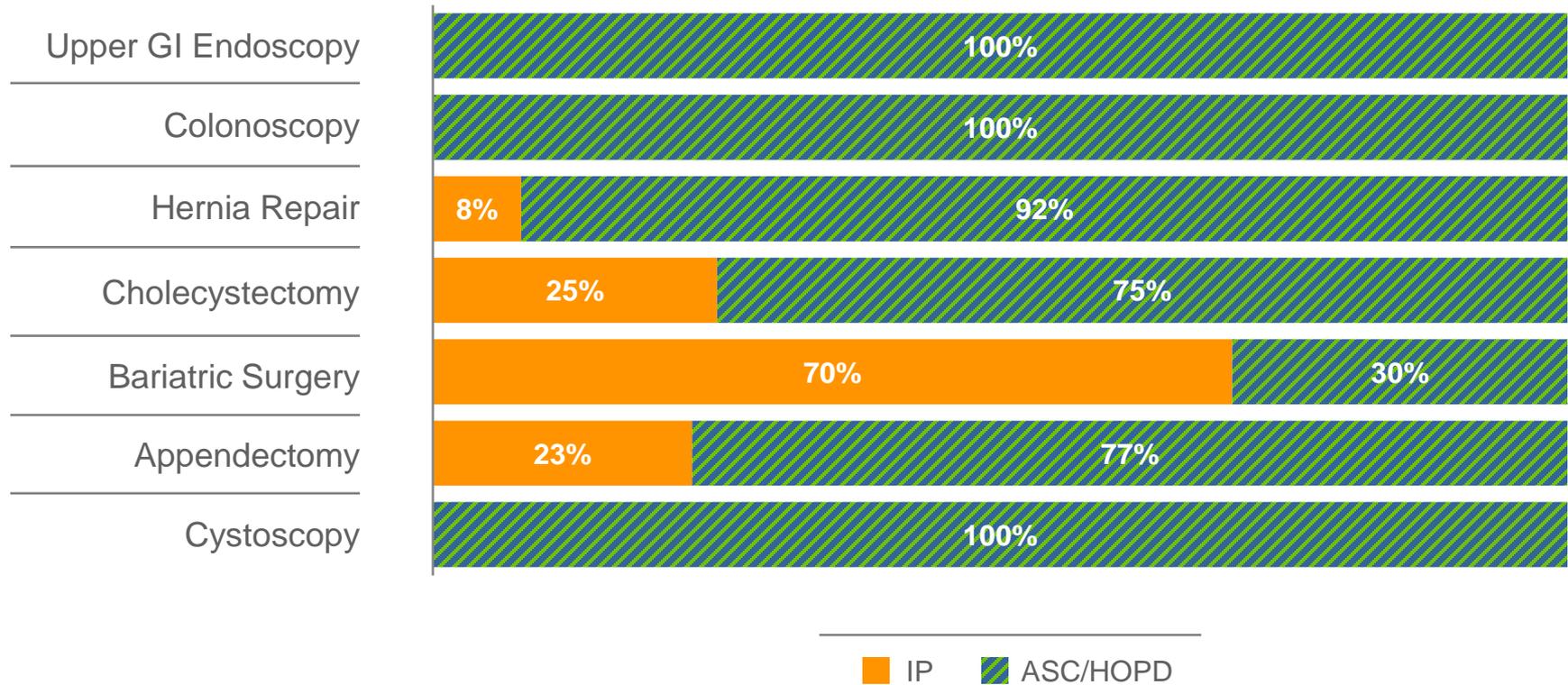
Note: Analysis excludes 0–17 age group. Percentages that do not add to 100% are due to rounding. GI = gastrointestinal.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

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General Surgery Expected to See Continued Outpatient Shift Across Ambulatory Sites

2028 Forecasted Procedure Breakout



Note: Analysis excludes 0–17 age group.

Sources: Impact of Change®, 2018; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2016; The following 2016 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

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