

Hospital Pharmaceutical Spend Trends & Market Shifts

Report: Q4 2019

Report Introduction

The American public has placed increasing pressure on manufacturers, regulators, and health systems to increase transparency of drug costs and alternatives. Compared with other high-income countries, the U.S. spends the most per capita on prescription drugs. In fact, the total U.S. expenditure on pharmaceuticals in 2016 was nearly \$500 billion. Not only do skyrocketing costs have an impact on patients' wallets, but increasingly their health, as the cost of some drugs is so high that patients make the decision to ration or forgo taking their medication altogether.

With rising healthcare costs top-of-mind for many Americans, the Department of Health and Human Services is playing an increasingly active role in promoting prescription drug price transparency. In May 2019, CMS released a final rule that "will require direct-to-consumer television advertisements for prescription pharmaceuticals covered by Medicare or Medicaid to include the list price – the Wholesale Acquisition Cost – if that price is equal to or greater than \$35 for a month's supply or the usual course of therapy."

Understanding medication cost is an important first step, but patients - as well as providers - need transparency into spend on specific drugs as well as appropriate, lower-cost alternatives.

This report seeks to:

1. Provide transparency into recent trends in hospital drug spending for several indications that are historically expensive to treat;
2. Highlight lower-cost alternative therapies, where clinically warranted, for these expensive indications, and elucidate whether prescribers are prescribing these alternatives; and
3. Share insights into the regulatory, economic and market factors that are playing a role in the observed hospital spending shifts.

Methodology

This report utilizes drug order data and wholesaler purchasing data from January 2018 to September 2019. Spend spans contract types (340b, WAC, GPO) and does not include rebates or reimbursement. Report data originates from 26 different healthcare facilities across four health systems in the Lumere network and is organized by Lumere into clinically categorized drug groups based on common use or indication. The following highlights drug spending changes due to new drug entry, provider utilization, drug shortages, changes in the guidelines and other market conditions coupled with insights from Lumere's research and advisory services expertise.

This report focuses on the below six drug groups based on a review of what groups are associated with the highest hospital spend, have experienced pricing trends and changes, and have evidence to support market shifts. See the “Appendix” section for the specific drugs included in each group.

1. Immune checkpoint inhibitors for small cell lung cancer (SCLC)
2. Agents for reversal of neuromuscular blockade (NMB)
3. Agents for migraine prevention
4. Colony-stimulating factors for neutropenia
5. Agents for multiple sclerosis (MS)
6. Agents for rheumatoid arthritis

Hospital Drug Spend by Product Group

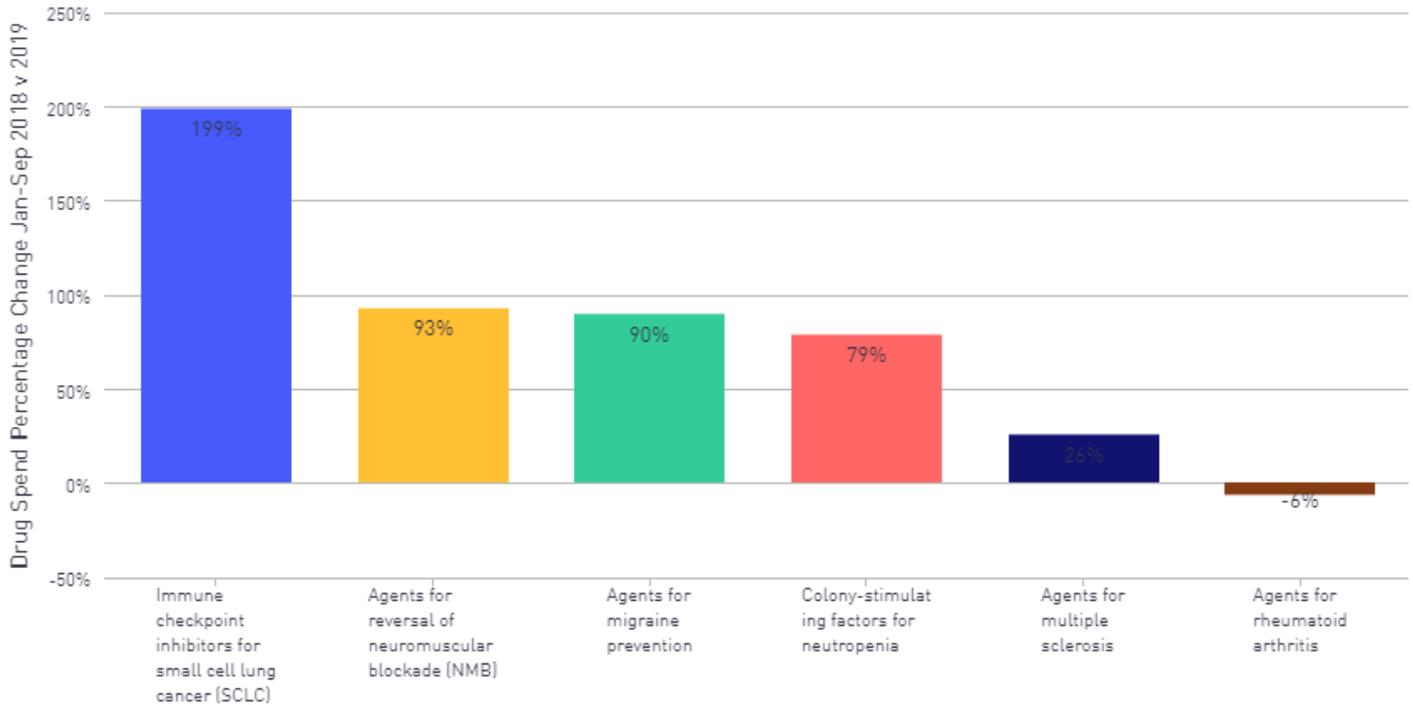


Fig. 1 Change in Drug Spend by Product Group from Highest to Lowest

Examining each drug group individually, several factors specific to that group emerge as cost drivers, such as new indications, updated clinical evidence and new market entrants. As Fig. 1 shows, of the drug groups reviewed, the group with the largest increase in hospital drug spend from Jan – Sep 2018 to 2019 was immune checkpoint inhibitors for small cell lung cancer at 199%. Meanwhile, agents for rheumatoid arthritis drug spend decreased by 6%. Below, we more closely examine each of the six groups (ordered by greatest increase in spend to least).

Immune checkpoint inhibitors for small cell lung cancer (SCLC)

These medications are used to treat patients with small cell lung cancer, an aggressive form of lung cancer that has often spread by the time it is detected. These medications are usually prescribed after chemotherapy fails.

Percentage of spend by product: Immune Checkpoint Inhibitors for Small Cell Lung Cancer (SCLC)

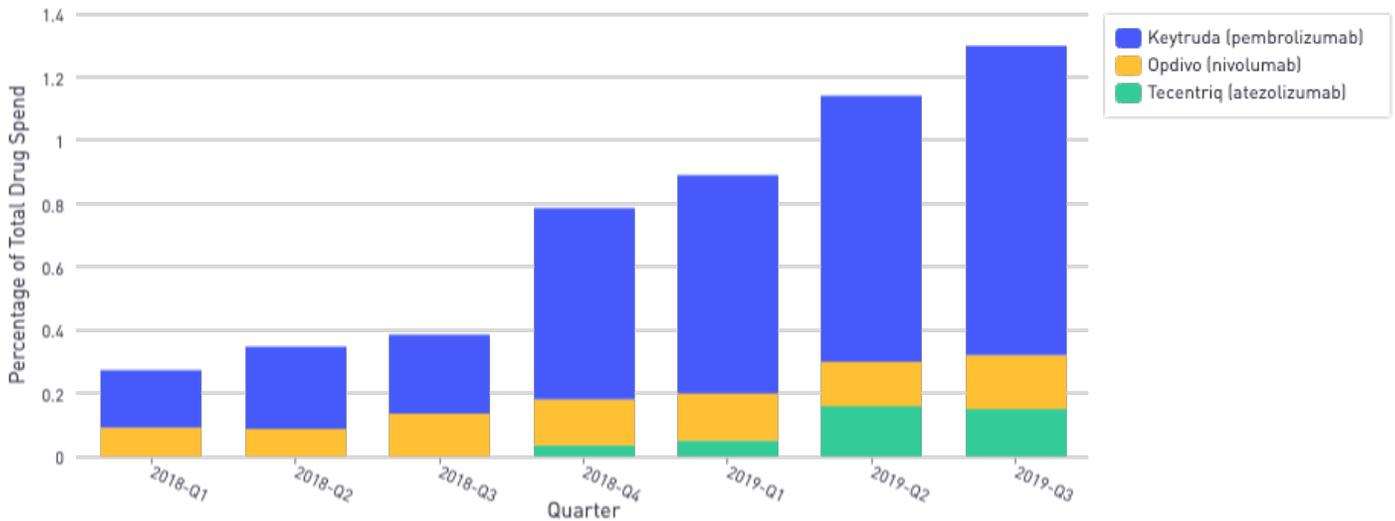


Fig. 2 SCLC Total Hospital Spend by Quarter

Observations:

- While overall spend on the group’s agents increased, the prices of the checkpoint inhibitors indicated for the treatment of SCLC (Opdivo, Keytruda and Tecentriq) remained consistent.

Analysis:

- In the past year, these three medications received a new indication for SCLC resulting in increased use in patients with SCLC.
- Spend continues to grow as oncology in general trends toward the use of targeted treatments and away from general chemotherapy. While there is potential for additional competition among agents for the treatment of SCLC, we may not see pricing concessions as these agents come from specialty pharmacies, rather than hospital pharmacies, where there is less incentive for vendors to cut prices. It is currently unclear whether spend will continue to grow or if it will reach a new “steady state.”

Agents for reversal of neuromuscular blockade (NMB)

These medications are used to speed up muscle recovery after an operation with the use of anesthesia to allow an individual to breathe on their own earlier.

Percentage of spend by product: Agents for Reversal of Neuromuscular Blockade (NMB)

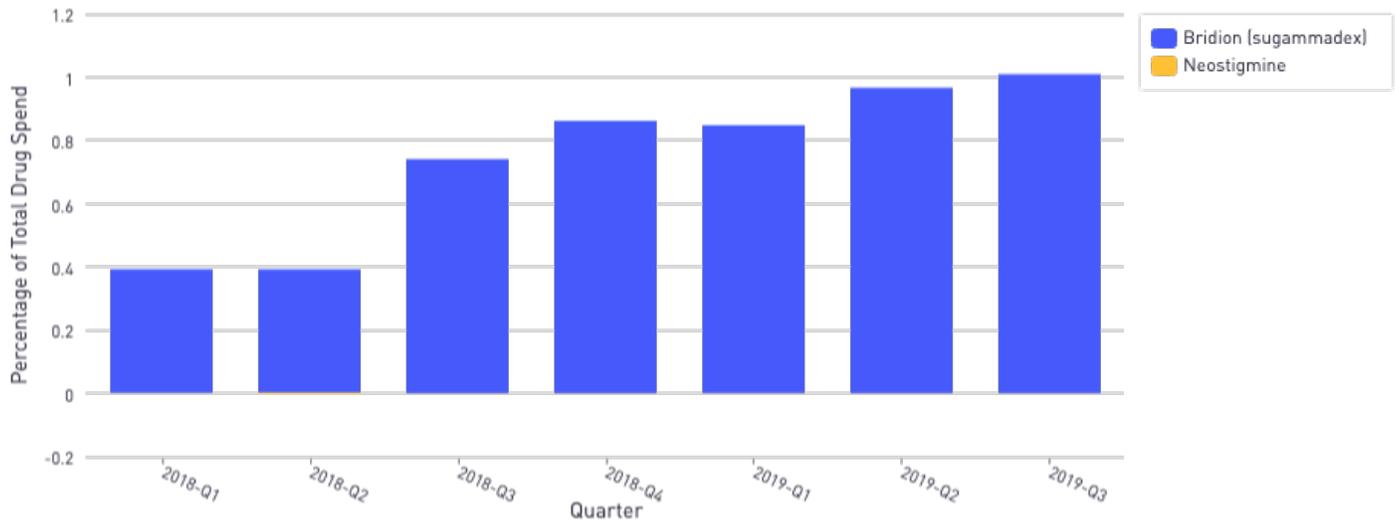


Fig. 3 NMB Total Hospital Spend by Quarter

Observations:

- Pricing remained relatively consistent over the 21-month time period while purchasing increased, driven almost entirely by Bridion (sugammadex).

Analysis:

- While Bridion has demonstrated faster time to recovery, questions remain about whether these effects are significant enough to provide a cost benefit over older cholinesterase inhibitors, and the clinical impact is unclear.
- Healthcare systems should assess patient outcomes by surgery type as well as by OR and PACU turnaround times to determine whether faster recovery aided by Bridion would translate to reduced costs of care and higher throughput at their organization.

Colony-stimulating factors for neutropenia

These medications are used to treat neutropenia, an abnormally low number of white blood cells, thereby reducing a patient’s risk of infection. Neutropenia can be caused by or associated with receiving cancer chemotherapy, or medical conditions including congenital disorders of the bone marrow and autoimmune disorders.

Percentage of spend by product: Colony-Stimulating Factors for Neutropenia

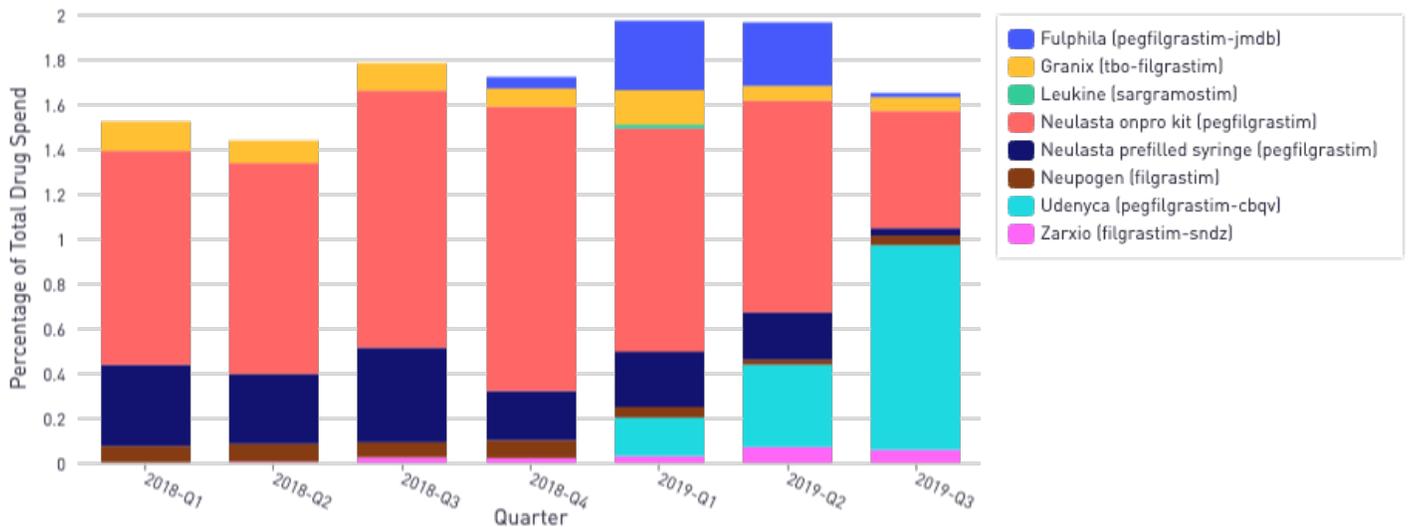


Fig. 4 Neutropenia Total Hospital Spend by Quarter

Observations:

- Percentage of spend on biosimilars increased by 500% between Jan – Sep 2018 and Jan - Sep 2019, while percentage of spend on biologics decreased by 4% in that same period.

Analysis:

- Neupogen (filgrastim), Neulasta (pegfilgrastim), and their biosimilars are all similarly effective for the treatment of neutropenia.
- Biosimilars for Neupogen have been FDA approved and on the market for several years and have been more widely adopted than biosimilars for Neulasta, which have only recently reached the market.
- Uptake of pegfilgrastim biosimilars is limited by the lack of an on-body injector device to compete with the Neulasta Onpro. The on-body injector accounts for approximately 60% of Neulasta purchases in many facilities whereas Neulasta biosimilars are only available as pre-filled syringes.

Agents for multiple sclerosis

These medications are used to treat multiple forms of multiple sclerosis, such as progressive and relapsing forms.

Percentage of spend by product: Agents for Multiple Sclerosis

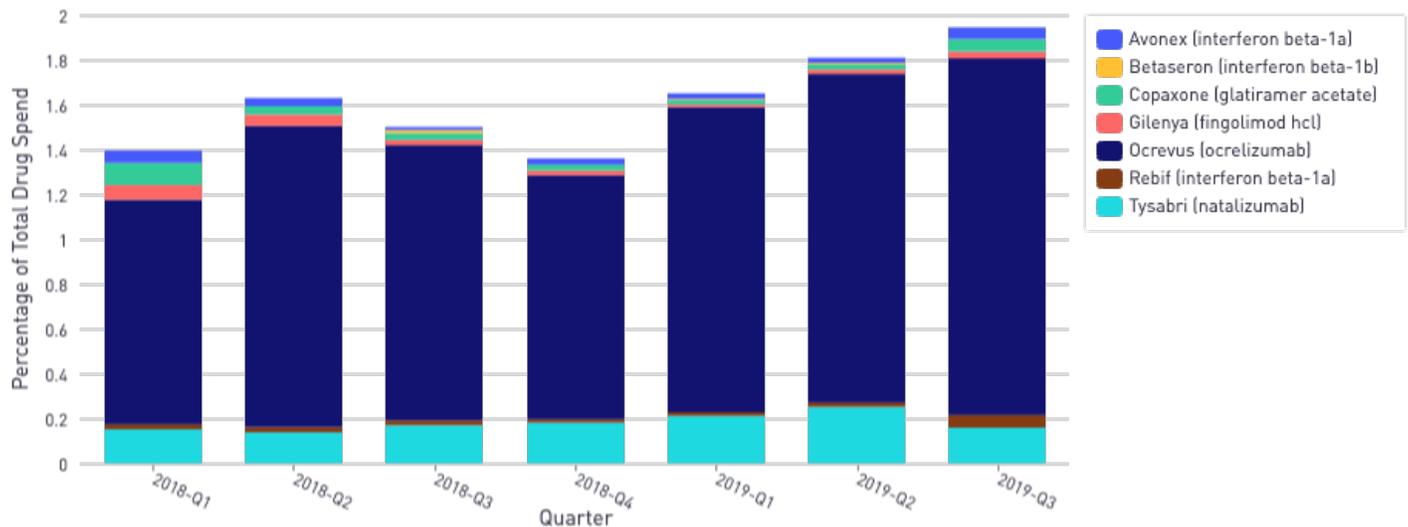


Fig. 5 MS Total Hospital Spend by Quarter

Observations:

- Percentage of spend on relatively newly approved Ocrevus (ocrelizumab) is increasing.

Analysis:

- Ocrevus is the only agent indicated for the treatment of both primary progressive and relapsing forms of MS and has demonstrated improved efficacy over Rebif and placebo in primary progressive and relapsing forms, respectively, and is similarly effective to other infusion therapies for relapsing forms, likely fueling an increase in utilization.

Agents for migraine prevention

Varying from injectable to oral formulations, these medications are used to prevent migraines in adults.

Percentage of spend by product: Agents for Migraine Prevention

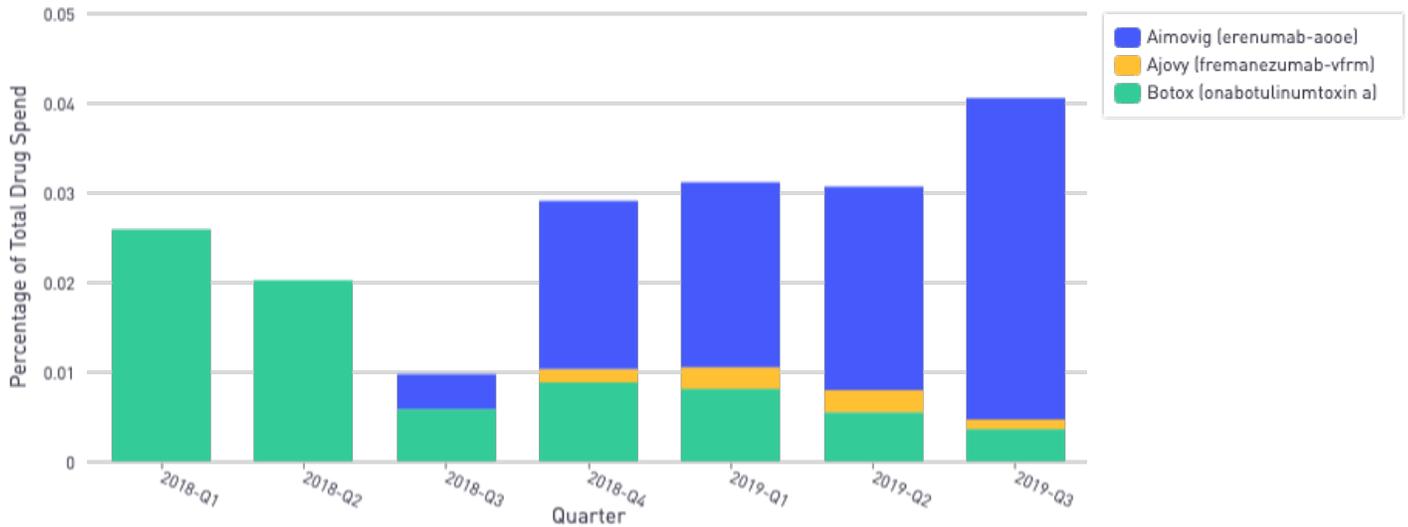


Fig. 6 Migraine Prevention Total Hospital Spend by Quarter

Observations:

- Purchasing of newer, more expensive products, Aimovig (erenumab-aooe) and Ajovy (fremanezumab-vfrm), results in an increase in overall group spend.
- Additionally, purchasing of an older therapy, Botox (onabotulinumtoxinA), has decreased.

Analysis:

- Decreased spend on Botox is likely attributable to the new arrival of Aimovig and Ajovy, which can be used to prevent both episodic and chronic migraines.
- While there are no head-to-head studies of Aimovig and Ajovy versus older therapies, the data on both drugs versus placebo shows benefit from using Aimovig or Ajovy.
- Botox is specifically indicated for chronic migraine. All other uses for episodic and tension-related migraines are off-label, so providers may be choosing other agents that are billed as preventing migraines in adults regardless of episodic or chronic status.

Agents for rheumatoid arthritis

These medications can be used for the treatment of rheumatoid arthritis.

Percentage of spend by product: Agents for Rheumatoid Arthritis

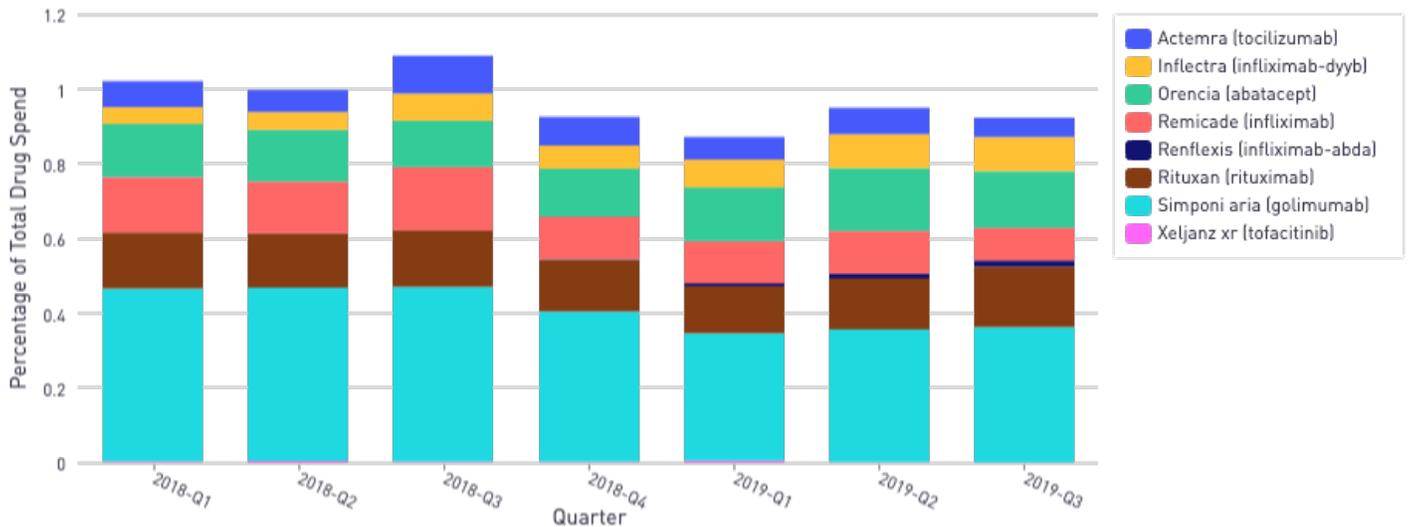


Fig. 7 Rheumatoid Arthritis Total Hospital Spend by Quarter

Observations:

- Spend on Remicade’s (infliximab) biosimilar, Inflectra (infliximab-dyyb), is increasing (especially at wholesale acquisition cost), while spend on Remicade is decreasing.

Analysis:

- Despite lower drug costs associated with Inflectra, adoption has been slow for the treatment of rheumatoid arthritis. Furthermore, in other indicated uses for Inflectra, such as psoriatic arthritis and ulcerative colitis, we have also observed a gradual increase in biosimilar adoption.
- Providers are often unwilling to change a patient’s treatment to a biosimilar who is well maintained on the originator product; thus, increased biosimilar use is likely due to adoption amongst newer patients.

Appendix

Drug Group	Products in Group
Agents for migraine prevention	Aimovig (erenumab-aooe) Ajovy (fremanezumab-vfrm) Amitriptyline hydrochloride Botox (onabotulinumtoxin a) Divalproex sodium dr Divalproex sodium er Emgality (galcanezumab) Lisinopril Metoprolol succinate Metoprolol tartrate Propranolol hydrochloride er Propranolol hydrochloride ir Timolol maleate Topiramate Trokendi xr (topiramate)
Agents for multiple sclerosis	Aubagio (teriflunomide) Avonex (interferon beta-1a) Betaseron (interferon beta-1b) Copaxone (glatiramer acetate) Extavia (interferon beta-1b) Gilenya (fingolimod hcl) Lemtrada (alemtuzumab) Ocrevus (ocrelizumab) Plegrixy pen (peginterferon beta-1a) Rebif (interferon beta-1a) Tecfidera (dimethyl fumarate) Tysabri (natalizumab)
Agents for reversal of neuromuscular blockade (NMB)	Bridion (sugammadex) Enlon (edrophonium) Enlon plus (edrophonium/atropine) Neostigmine Regonol (pyridostigmine)
Agents for rheumatoid arthritis	Actemra (tocilizumab) Cimzia (certolizumab pegol) Enbrel (etanercept)

Drug Group	Products in Group
Agents for rheumatoid arthritis (cont.)	Humira (adalimumab) Inflectra (infliximab-dyyb) Kevzara (sarilumab) Kineret (anakinra) Olumiant (baricitinib) Orenzia (abatacept) Remicade (infliximab) Rituxan (rituximab) Simponi aria (golimumab) Simponi (golimumab) Xeljanz xr (tofacitinib)
Colony-stimulating factors for neutropenia	Fulphila (pegfilgrastim-jmdb) Granix (tbo-filgrastim) Leukine (sargramostim) Neulasta onpro kit (pegfilgrastim) Neulasta prefilled syringe (pegfilgrastim) Neupogen (filgrastim) Nivestym (filgrastim-aafi) Udenyca (pegfilgrastim-cbqv) Zarxio (filgrastim-sndz)
Immune checkpoint inhibitors for small cell lung cancer (SCLC)	Keytruda (pembrolizumab) Opdivo (nivolumab) Tecentriq (atezolizumab)