BioHarmony Case Study: Trends and Revenue for Cancer Drugs

A case study using BioHarmony data to explore trending cancer therapies for multiple myeloma and their impact on revenues of existing treatment regimens

Key Takeaways.

- Overall, this case study demonstrates how BioHarmony can be used to investigate changes to the treatment landscape for a particular disease area through identification of newly licensed therapies and their impact on more established therapies.
- These data indicate that the entry of new therapeutics into the market had a direct, quantifiable impact on the revenue generation of more established therapies within a year of their approval.

Introduction.

BioHarmony is a drug database that centralizes a broad range of information, spanning clinical, commercial, and financial data, allowing users to form a holistic understanding about the drug or disease area. In addition, BioHarmony helps monitor emerging "Trends" which enables users to quickly gain up-to-date information about changing research for specific drugs and diseases.

BioHarmony was used to evaluate new therapies for patients with cancer between January 2020 and April 2021. Using the US Food and Drug Administration (FDA) 2020 and 2021 Drug Approval Data Sets, several new therapies approved for use over the previous 16 months were identified for multiple myeloma (MM). These therapies included several new technologies (eg, antibody drug conjugates and T-cell immunotherapy) summarized in Table 1.

Table 1. New therapies approved for use in patients with multiple myeloma in 2020 and 2021

Therapy	Initial US Approval	Target/Technology
Sarclissa (isatuximab-irfc)	03/2020	Anti-CD38 monoclonal antibody
Blenrep (belantamab mafodotin-blmf)	08/2020	TNFRSF17 antibody drug conjugate
Abecma (idectagene vicleucel)	03/2021	TNFRS17-directed T cell immunotherapy

CD38=cluster of differentiation 38; TNFRS17=tumor necrosis factor receptor superfamily member 17; US=United States
Source: BioHarmony[1], including Sarclissa US PI[2], Blenrep US PI[3], Abecma US PI[4] obtained through links provided within the BioHarmony report.

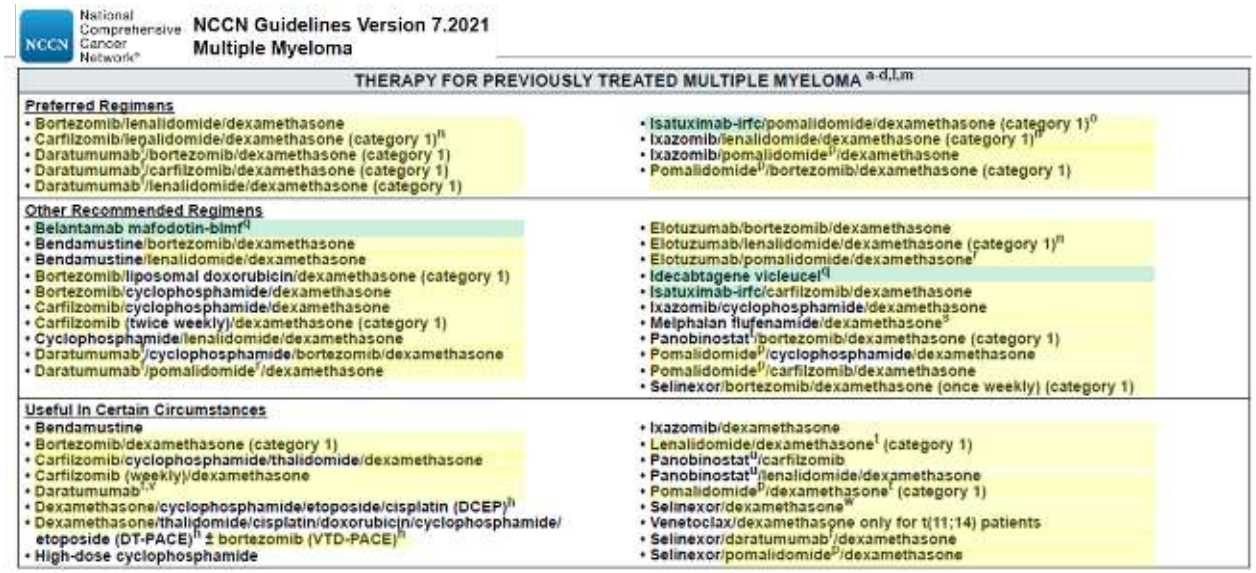
Assessment of Trending Treatments.

The "Trends" section in BioHarmony reports terms that are commonly associated with a particular drug name in PubMed Central, with subdivisions into several categories (*i.e.*, disease or syndrome; pharmacological substance; amino acid, peptide, or protein; cell; and laboratory procedure). Using the pharmacological substance term identified daratumumab, lenalidomide, bortezomib, pomalidomide, elotuzumab, carfilzomib, dexamethasone, corticosterone, asciminib, and pirtobrutinib as being commonly associated in the literature with the new therapies licensed for MM. The National Comprehensive Cancer Network® (NCCN) clinical guideline for MM[6] confirmed that most of these therapies (70%) are established as recommended treatments for MM and are used at the same point in the treatment pathway as the recently approved therapies (eg, in relapsed/refractory multiple myeloma

[RRMM]). Only corticosterone, asciminib, and pirtobrutinib were not included in the NCCN guidelines; asciminib and pirtobrutinib are investigational therapies as of May 2021.

Figure 1 summarizes the NCCN recommended treatment regimens for RRMMidentified through BioHarmony using the approach described above.

Figure 1. National Comprehensive Cancer Network recommended therapies for multiple myeloma



NCCN Guidelines Version 7.2021
Multiple Myeloma

THERAPY FOR PREVIOUSLY TREATED MULTIPLE MYELOMA [a-d,l,m]

Preferred Regimens

- Bortezomib/lenalidomide/dexamethasone
- Carfilzomib/lenalidomide/dexamethasone (category 1)[n]
- Daratumumab/bortezomib/dexamethasone (category 1)
- Daratumumab/carfilzomib/dexamethasone (category 1)
- Daratumumab/lenalidomide/dexamethasone (category 1)
- Isatuximab-irfc/pomalidomide/dexamethasone (category 1)[o]
- Ixazomib/lenalidomide/dexamethasone (category 1)[n]
- Ixazomib/pomalidomide[j]/dexamethasone
- Pomalidomide[j]/bortezomib/dexamethasone (category 1)

Other Recommended Regimens

- Belantamab mafodotin-blmf[q]
- Bendamustine/bortezomib/dexamethasone
- Bendamustine/lenalidomide/dexamethasone
- Bortezomib/liposomal doxorubicin/dexamethasone (category 1)
- Bortezomib/cyclophosphamide/dexamethasone
- Carfilzomib/cyclophosphamide/dexamethasone
- Carfilzomib (twice weekly)/dexamethasone (category 1)
- Cyclophosphamide/lenalidomide/dexamethasone
- Daratumumab/cyclophosphamide/bortezomib/dexamethasone
- Daratumumab/pomalidomide[j]/dexamethasone
- Elotuzumab/bortezomib/dexamethasone
- Elotuzumab/lenalidomide/dexamethasone (category 1)[n]
- Elotuzumab/pomalidomide/dexamethasone[r]
- Idecabtagene vicleucel[q]
- Isatuximab-irfc/carfilzomib/dexamethasone
- Ixazomib/cyclophosphamide/dexamethasone
- Melphalan flufenamide/dexamethasone[s]
- Panobinostat[t]/bortezomib/dexamethasone (category 1)
- Pomalidomide[j]/cyclophosphamide/dexamethasone
- Pomalidomide[j]/carfilzomib/dexamethasone
- Selinexor/bortezomib/dexamethasone (once weekly) (category 1)

Useful in Certain Circumstances

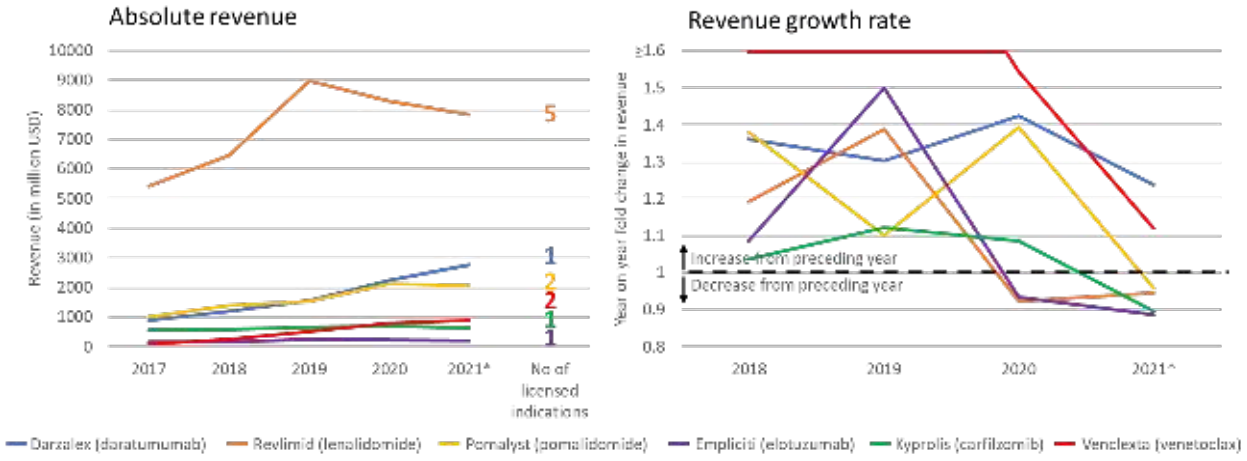
- Bendamustine
- Bortezomib/dexamethasone (category 1)
- Carfilzomib/cyclophosphamide/thalidomide/dexamethasone
- Carfilzomib (weekly)/dexamethasone
- Daratumumab[u,v]
- Dexamethasone/cyclophosphamide/etoposide/cisplatin (DCEP)[n]
- Dexamethasone/thalidomide/cisplatin/doxorubicin/cyclophosphamide/etoposide (DT-PACE)[n] ± bortezomib (VTD-PACE)[n]
- High-dose cyclophosphamide
- Ixazomib/dexamethasone
- Lenalidomide/dexamethasone[t] (category 1)
- Panobinostat[u]/carfilzomib
- Panobinostat[u]/lenalidomide/dexamethasone
- Pomalidomide[j]/dexamethasone[t] (category 1)
- Selinexor/dexamethasone[w]
- Venetoclax/dexamethasone only for t(11;14) patients
- Selinexor/daratumumab/dexamethasone
- Selinexor/pomalidomide[p]/dexamethasone

Green highlighting depicts newly licensed therapies for MM identified through the BioHarmony FDA 2020 and FDA 2021 Drug Approval drug sets.
Yellow highlighting depicts competitor therapies for MM identified through the BioHarmony "Trends" function.
FDA=Food and Drug Administration; MM=multiple myeloma; NCCN=National Comprehensive Cancer Network

Impact on Revenue.

The impact of new MM therapies on the revenue data for more established therapies was evaluated. For therapies with US data available in BioHarmony (carfilzomib, daratumumab, elotuzumab, lenalidomide, pomalidomide, and venetoclax), revenue decreased between 2020 and the first quarter of 2021 except for daratumumab and venetoclax, with both having shown continued growth since 2017, with revenue generally reflecting the number of indications for each product (Figure 2). Revenue growth between 2020 and the first quarter of 2021 decreased or was reduced for all established therapies.

Figure 2. Reported revenue of established multiple myeloma drugs



Reported annual revenue for pharmaceutical products listed as a recommended treatment for RRMM in the NCCN guideline for MM for which US revenue information was available in BioHarmony.
*2021 annual revenue figures were estimated from first quarter figures.
MM=multiple myeloma; RRMM=relapse/refractory multiple myeloma; US=United States; USD=United States dollar

Closing Remarks. Patient survival is strongly influenced by the availability of different treatment options, and it is hoped that the introduction of new classes of treatment for MM will continue the trend for improved survival that has been evident for this disease since 2000. In a short period of time, market forces adjust to adopt superior treatments for Multiple Myeloma.[7]

Bibliography and resources

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