The relationship between promotional spending on drugs and their therapeutic gain: a cohort analysis

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Abstract:	Background The value of promotion in helping doctors prescribe appropriately is debated. This study looks at the most heavily promoted drugs and their therapeutic gain to help determine whether doctors should be using promotional material to inform themselves about therapeutically important drugs. Methods Lists were constructed of the most heavily promoted drugs and the top selling drugs by dollar value for 2013, 2014 and 2015. Therapeutic gain was categorized as major, moderate or little to no and was determined by examining ratings from the Patented Medicine Prices Review Board and the French drug bulletin Prescrire International. For each of the three years, the number of drugs in the three therapeutic categories for drugs in both groups was compared. The amount and percent of money spent on promotion for drugs in each of the three therapeutic categories for the three years was also determined. Results Therapeutic ratings were available for 42 of the most heavily promoted drugs and 40 of the top selling drugs. The distribution of therapeutic gain for drugs in both groups was not statistically different in any of the three years. Nearly all the money spent on promotion in each of the three years went to drugs with little to no therapeutic gain. Interpretation Most of the money spent on promotion went to drugs that offer little to no therapeutic gain. This result calls whether doctors should read journal advertisements or see sales representatives if their purpose in doing so is to acquire information about important medical therapies.

The relationship between promotional spending on drugs and their therapeutic gain: a cohort analysis

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In 2015 he received payment from a for-profit organization for being on a panel that discussed expanding drug insurance in Canada. He is on the Foundation Board of Health Action International.

Abstract

Background

The value of promotion in helping doctors prescribe appropriately is debated. This study looks at the most heavily promoted drugs and their therapeutic gain to help determine whether doctors should be using promotional material to inform themselves about therapeutically important drugs.

Methods

Lists were constructed of the most heavily promoted drugs and the top selling drugs by dollar value for 2013, 2014 and 2015. Therapeutic gain was categorized as major, moderate or little to no and was determined by examining ratings from the Patented Medicine Prices Review Board and the French drug bulletin Prescrire International. For each of the three years, the number of drugs in the three therapeutic categories for drugs in both groups was compared. The amount and percent of money spent on promotion for drugs in each of the three therapeutic categories for the three years was also determined.

Results

Therapeutic ratings were available for 42 of the most heavily promoted drugs and 40 of the top selling drugs. The distribution of therapeutic gain for drugs in both groups was not statistically different in any of the three years. Nearly all the money spent on promotion in each of the three years went to drugs with little to no therapeutic gain.

Interpretation

Most of the money spent on promotion went to drugs that offer little to no therapeutic gain. This result calls whether doctors should read journal advertisements or see sales representatives if their purpose in doing so is to acquire information about important medical therapies.

Introduction

Pharmaceutical companies often claim that they promote their products in order to bring them to the attention of doctors and to inform doctors about them. This orientation is reflected in a statement about the role of pharmaceutical sales representatives issued by Rx&D (now Innovative Medicines Canada): "Provider-supported detailing generates awareness about new treatments and provides science-based and Health Canada approved advice on how to administer these medications" (1). Ads for medicines that appear in Canadian medical journals are prescreened by the independent Pharmaceutical Advertising Advisory Board to ensure compliance with the PAAB Code of Advertising Acceptance, a code that is endorsed by companies belonging to Innovative Medicines Canada. In part, the mandate of the PAAB reads: "The PAAB reviews materials developed by pharmaceutical manufacturers predominantly for the purpose of advertising or promoting…a product to healthcare professionals and increasing their awareness of that brand" (2).

There is general acceptance that the use of promotion by doctors influences their prescribing behaviour, although there is disagreement about the direction of that influence – towards more or less rational prescribing (3, 4) and therefore disagreement about the value of promotion. This study looks at the most heavily promoted drugs and the therapeutic gain from those products. It also compares the therapeutic gain from the most promoted drugs and the top selling drugs by dollar value. Examining whether the medicines that are heavily promoted are the ones that provide the most therapeutic gain may help in determining whether doctors should be using promotional material to inform themselves about therapeutically important drugs.

Methods

Construction of list of most promoted drugs and top selling drugs

The annual reports from IMS|Brogan contain information about the amount of money spent on journal ads and visits by sales representatives for the top 50 most promoted drugs in Canada and also list the top 50 products by sales revenue. From the reports for the years 2013, 2014 and 2015 (5-7) the following information was extracted for the top 50 promoted drugs in each year: generic name, brand name and amount spent on promotion. For the top 50 selling products in each year the generic and brand names were recorded. The list of the top 50 products includes devices for measuring blood glucose and these were excluded from the analysis as were generics if the brand name drug was also in the list of top 50 products. Different formulations of the same drug were treated as unique products.

Determination of therapeutic gain

The therapeutic gain from products was determined from information on the website of the Patented Medicine Prices Review Board (PMPRB) (http://www.pmprb-cepmb.gc.ca/pmpMedicines.asp?x=611) and the independent French drug bulletin Prescrire International (http://english.prescrire.org/en/Search.aspx, subscription required). The PMPRB is a federal agency that is responsible for calculating the maximum introductory price for all new patented medications introduced into the Canadian market. It is important to note that the PMPRB is not a payer and therefore its decisions about therapeutic value are not influenced by how much it might have to pay for the product. As part of the process of determining the price, the PMPRB's independent HDAP determines the therapeutic value of each product it reviews and these evaluations are available on its website (http://www.pmprb-cepmb.gc.ca/pmpMedicines.asp?x=611). HDAP determines the ratings for the drugs before the maximum price is established and uses a 4-point scale: breakthrough, substantial improvement, moderate (primary or secondary), slight or no improvement. In deciding on the

level of therapeutic innovation HDAP considers two primary factors: increased efficacy and reduction in incidence or grade of important adverse reactions and nine secondary factors: route of administration, patient convenience, compliance improvements leading to improved therapeutic efficacy, caregiver convenience, time required to achieve the optimal therapeutic effect, duration of usual treatment course, success rate, percentage of affected population treated effectively and disability avoidance/savings. The primary factors are given the greatest weight, followed by an assessment of any additional improvement as a result of the secondary factors (8).

Prescrire assesses the therapeutic value of medicines through a multistep process. First, it "examines the condition or clinical setting for which the drug is proposed; then the natural course of the disease, the efficacy and safety of existing treatments, and the most relevant outcome measures. This is followed by a systematic search for clinical data on the efficacy and adverse effects of the new drug, and an assessment of the level of evidence. Based on [its] independent analysis of clinical data, [it] form[s] a judgement as to whether or not the new drug is beneficial for patients or whether or not its harmful effects outweigh the benefit" (9). Based on its analysis, it rates products using the following 7 categories: bravo (major therapeutic innovation in an area where previously no treatment was available); a real advance (important therapeutic innovation but has limitations); offers an advantage (some value but does not fundamentally change the present therapeutic practice); possibly helpful (minimal additional value and should not change prescribing habits except in rare circumstances); nothing new (may be new molecule but is superfluous because does not add to clinical possibilities offered by previously available products); not acceptable (without evident benefit but with potential or real disadvantages); judgment reserved (decision postponed until better data and more thorough evaluation) (10).

Analysis

The categories used by the PMPRB and Prescrire were collapsed into three ratings of therapeutic gain: major therapeutic gain, moderate therapeutic gain and little to no therapeutic gain. (See Table 1.) (The Prescrire category of "judgment reserved" was not used in constructing the rating scale.) Therapeutic gain for each of the most promoted and top selling drugs was assigned based on the rating scale. If both the PMPRB and Prescrire rated a drug and the ratings were different then the highest ranking rating was used. For each of the three years, the number of drugs in the three therapeutic categories for the most promoted and top selling drugs was compared using the Chi square test with $p < 0.05$ being defined as statistically significant. The amount and percent of money spent on promotion for drugs in each of the three therapeutic categories for the three years was also determined. Statistical calculations were done with Prism 7 (GraphPad Software).

As this study did not involve any patients and all the material was publicly available ethics review was not necessary.

Results

There were 79 unique most promoted drugs over the three years and therapeutic evaluations were available for 42 of these: 2013 – 29/51, 2014 – 30/50 and 2015 – 29/45. (See Appendix 1 for a list of all the drugs, the amount spent on promoting them and their therapeutic rating, where available.) There were 66 unique top selling products; five were excluded, three because they were instruments for measuring blood glucose and two were generics with the brand-name product also among the top 50 for the year. Of the remaining 61 drugs, therapeutic evaluations were available for 40 of them: 2013 – 30/48, 2014 – 29/49 and 2015 –

29/46. (See Appendix 2 for a list of all the drugs and their therapeutic rating, where available.) Only 13 drugs were in both groups.

In both groups of drugs the large majority were rated as little to no therapeutic gain: most promoted drugs 87.9% to 96.4%, top selling drugs 76.7% to 79.3%. (Table 2). The distribution of therapeutic gain for both groups was not statistically different in any of the three years (Table 2).

Nearly all the money spent on promotion in each of the three years went to drugs with little to no therapeutic gain: 2013 – 96.5%, 2014 – 92.0%, 2015 – 93.8% (Table 3). In 2013, there was no money spent promoting drugs offering a major therapeutic gain and even for drugs with a moderate therapeutic gain the highest percent of promotional spending was only 5.7 in 2014.

Interpretation

Most of the money spent on promotion in the form of journal ads and visits by sales representatives goes to drugs that offer little to no therapeutic gain. This finding could be interpreted as meaning that drug companies are not interested in informing doctors about the drugs that could make a significant difference in the therapy that doctors prescribe for their patients. However, the finding that there is no difference in the therapeutic distribution between the most promoted drugs and the top selling drugs could also mean that there are few drugs that present a major therapeutic gain and therefore few to invest promotional dollars into. In either case, the conclusion seems to be the same; if doctors want to learn about drugs that are true advances then using promotion is not the way to do so. Other factors besides therapeutic gain enter into decisions about what drug to prescribe to an individual

patient including patient preferences, adverse reactions to specific drugs, insurance coverage and other medications a patient is taking. However, none of this information is available through promotional channels.

Interestingly, the companies do not see the need to heavily promote the majority of their best-selling drugs through journal advertising or visits from sales representatives. It is, of course, possible that these drugs are being promoted through other methods. Also, the minority of drugs with a high therapeutic value may sell well without the need to promote them.

In 2015, just over a third of Canadian doctors were not seeing sales representatives, but 11% of saw 6 or more a month (11) and in that year there was a total of 3,720,000 visits, including 111,000 for Coversyl (perindopril, used for high blood pressure), 100,000 for Breo Ellipta (fluticasone and vilanterol, used for asthma) and 73,000 for Invokana (canagliflozin, used for diabetes) (7), three of the most heavily promoted drugs examined in this paper. The comprehensiveness of the safety information provided by sales representatives when they visit doctors was investigated in a study involving primary care practitioners in Vancouver and Montreal. “Minimally adequate safety information” defined *a priori* as the mention of 1 or more of the following: approved indications, serious adverse events, common non-serious adverse events and contraindications *and* no unapproved indications or unqualified safety claims (e.g., “this drug is safe”) was provided in 5/412 (1.2%) of promotions in Vancouver and 7/423 (1.7%) in Montreal. Representatives did not provide any information about harms (a serious adverse event, a common adverse event or a contraindication) in two-thirds of interactions (12).

The pharmaceutical industry spent almost $563 million on journal advertising and sales representatives visits with unknown amounts going to the 14 million samples left behind (7), key opinion leaders to give talks, meetings, direct-to-consumer advertising, booths at medical conferences and other forms of promotion. Aside from whether the promotion is biased or not, if the vast majority is going to what are colloquially termed "me too" drugs, is this money well spent in terms of fulfilling the industry's professed mandate of providing "access to education and information about the appropriate uses of our products and services" (13) to doctors?

In a related study, Greenway and Ross used the Open Payments Database set up under the United States Physicians Payments Sunshine Act to look at the 25 drugs associated with the largest total payments to physicians and teaching hospitals, excluding research payments, royalties and licensing fees (14). They found that the most promoted ones had a significantly lower proportion of "first in class" or "advance in class" drugs compared to the 25 top selling products and that the most promoted group also contained significantly fewer products on the World Health Organization's Essential Medicines List. The similarity in the findings between their study and this one, in terms of the therapeutic gain from heavily promoted products, suggests that the pattern of how promotional spending is distributed may be present in multiple jurisdictions.

Limitations

The main limitation to this study is that therapeutic evaluations were only available for 53% of the most promoted drugs and 66% of the top selling ones. Therefore, distribution of therapeutic gain in each of these groups may have been different if larger numbers of products were available for analysis. Neither the PMPRB nor Prescrire revisit their

evaluations, except in the case where the initial Prescrire rating is judgment reserved, and it is possible that a re-evaluation may have resulted in a different rating for some drugs. The conclusion about the therapeutic gain from the most promoted products is based on money spent oon visits by sales representatives and journal advertising. It is possible, although unlikely, that other forms of promotion are directed to products with a higher degree of therapeutic gain. Finally, there is the assumption that the evaluations by PMPRB and/or Prescrire represent a gold standard in the assessment of a drug's therapeutic gain. While there is always a legitimate debate about therapeutic gain, the rigorous processes that these organizations use to arrive at their conclusions and their independence give strong face validity to their assessments.

Conclusion

The focus on promoting primarily drugs with little to no therapeutic gain calls into question the value of doctors reading journal advertisements or seeing sales representatives if their purpose in doing so is to acquire information about important medical therapies.

References

1. Rx&D. Where we stand: detailing. Ottawa: Canada's Research-Based Pharmaceutical Companies; 2010. p. 2.

2. Pharmaceutical Adverising Advisory Board. Code of advertising acceptance Pickering: PAAB; 2013 [cited 2014 September 13]. Available from: http://www.paab.ca/paab-code.htm.

3. PhRMA. The facts about pharmaceutical marketing & promotion. Washington DC: 2008.

4. Spurling G, Mansfield PR, Montgomery B, Lexchin J, Doust J, Othman N, et al. Information from pharmaceutical companies and the quality, quantity, and cost of physicians' prescribing: a systematic review. PLoS Medicine. 2010;7:e1000352.

5. Canadian pharmaceutical industry review 2013 Montreal: ims | brogan; 2014 [cited 2017 January 31]. Available from: http://imsbrogancapabilities.com/YIR_2013_FINAL.

6. Canadian pharmaceutical industry review 2014 Montreal: imshealth | brogan; 2015 [cited 2017 January 31]. Available from: http://imsbrogancapabilities.com/YIR_2014_FINAL.

7. Canadian pharmaceutical industry review 2015 Montreal: imshealth | brogan; 2016 [cited 2017 January 31]. Available from: http://imsbrogancapabilities.com/YIR_2015_FINAL.

8. Patented Medicine Prices Review Board. Compendium of policies, guidelines and procedures - reissued June 2013: PMPRB; 2014 [cited 2014 July 20]. Available from: http://www.pmprb-cepmb.gc.ca/view.asp?ccid=492 - 1637.

9. Prescrire Editorial Staff. Prescrire's ratings system: gauge the usefulness of new products at aglance Paris2011 [cited 2015 March 11]. Available from: http://english.prescrire.org/en/81/168/46800/0/NewsDetails.aspx.

10. Prescrire Editorial Staff. Prescrire's rating system. Prescrire International. 2002;11:43.

11. Leslie C. Relationship between MDs and pharma changing. Medical Post. 2015 September 15.

12. Mintzes B, Lexchin J, Sutherland J, Beaulieu M-D, Wilkes M, Durrieu G, et al. Pharmaceutical sales representatives and patient safety: a comparative prospective study of information quality in Canada, France and the United States. Journal of General Internal Medicine. 2013;28:1368-75.

13. Innovative Medicines Canada. Code of Ethical Practices Ottawa 2016 [cited 2016 October 18]. Available from: http://innovativemedicines.ca/wp-content/uploads/2015/06/IMC_Code_EN.pdf.

14. Greenway T, Ross J. US drug marketing: how does promotion correspond with health value? BMJ. 2017;357:j1855.

Table 1: Therapeutic rating scale

	Patented Medicine Prices Review Board	Prescrire International*
Major therapeutic gain	• breakthrough • substantial improvement,	• bravo • a real advance
Moderate therapeutic gain	• moderate (primary or secondary)	• offers an advantage
Little to no therapeutic gain	• slight or no improvement	• possibly helpful • nothing new • not acceptable

* The Prescrire category "judgment reserved" was not used.

Table 2: Therapeutic value of most promoted and top selling drugs

	2013		2014		2015	
	Top promoted drugs – number (%)	**Top selling drugs – number (%)**	**Top promoted drugs – number (%)**	**Top selling drugs – number (%)**	**Top promoted drugs – number (%)**	**Top selling drugs – number (%)**
Major therapeutic gain	0 (0)	5 (16.7)	1 (3.4)	4 (13.8)	1 (3.1)	4 (13.8)
Moderate therapeutic gain	1 (3.6)	2 (6.7)	2 (6.9)	2 (6.9)	2 (6.3)	2 (6.9)
Little to no therapeutic gain	27 (96.4)	23 (76.7)	26 (89.7)	23 (79.3)	29 (90.6)	23 (79.3)

2013: Chi square p = 0.0611
2014: Chi square p = 0.3709
2015: Chi square p = 0.3087

Table 3: Amount spent on promotion by therapeutic value

	Promotion spending ($000) – amount (% of total)		
	2013	**2014**	**2015**
Major therapeutic gain	0 (0)	3711 (2.3)	3359 (1.6)
Moderate therapeutic gain	5816 (3.5)	9350 (5.7)	9268 (4.5)
Little to no therapeutic gain	159999 (96.5)	149941 (92.0)	192644 (93.8)
Total spending	165815	163002	205271

Appendix 1: Top Promoted Drugs, by Year

Generic name	Brand name	Amount spent on promotion (details + journal ads (000)) 2013	2014	2015	Therapeutic r Major therapeutic gain
Aclidinium	Tudorza Genair			5608	
Apixaban	Eliquis	9372	6666	7653	
Aripiprazole	Abilify	5274	7019	7046	
Canagliflozin	Invokana		7513	13037	
Celecoxib	Celebrex	5851	3826		
Ciclesonide	Alvesco	4968	4702	3634	
Colesevelam	Lodalis		3535	4478	
Dabigatran	Pradaxa	7867	6111	4143	
Dapagliflozin	Forxiga			10344	
Denosumab	Prolia	5816	5836	6515	
Desvenlafaxine	Pristiq	7901	6952	8437	
Dexlansoprazole	Dexilant	8266	8473	7570	
Duloxetine	Cymbalta	8511	9466	4835	
Efinaconazole	Jublia			3304	
Escitaloprim	Cipralex	5515	3322		
Fesoterodine	Toviaz	4653	4899	3741	
Fluticasone	Avamys	9321	7921	4221	
Fluticasone and vilatnerol	Breo Ellipta		4669	15655	
Indacaterol	Onbrez Breezhaler	3460	3624		
Linaclotide	Constella			6786	
Linagliptin	Trajenta	6249	4956	3810	
Liraglutide	Victoza	6536	4159	3517	
Lisdexamfetamine	Vyvanse	4145	3578	3287	
Lurasidone	Latuda		4045	3660	
Mirabegron	Myrbetriq		3097	8094	
Multicomponent meningococcal B vacine	Bexsero		3711		1
Nebivolol	Bystolic	3440			
Olmesartan	Olmetec	3299	2850	3027	
Perindopril	Coversyl	12279	14134	17130	
Pregabalin	Lyrica	3209			
Prucalopride	Resotran	5636			
Recombinant human papillomavirus	Gardasil			3359	1

Rivaroxaban	Xarelto	10857	11995	11486
Saxagliptin	Onglyza	3575		3535
Silodosin	Rapaflo	4743	3034	
Sitagliptin	Januvia	3404		2934
Solifenacin	Vesicare	3006		
Tadalafil	Cialis	4245	3748	2757
Tiotropium	Spiriva	4417	5647	
Ulipristal	Fibristal		3514	2753
Umeclininium and vilanterol	Anoro Ellipta			6769
Vortioxetine	Trintellix			12146
		Therapeutic Evaluation Not Available		
Aclidinium	Tudorza		4345	
Adapalene and benzoyl peroxide	Tactuo	3185		
Adapalene and benzoyl peroxide	Tactupump		3359	2905
Budesonide and formoterol	Symbicort	10675	12133	9707
Buprenorphine	Butrans			4171
Calcipotriol and betamethasone	Dovobet	3847		
Ciclesonide	Omnaris	4153	4099	
Clarithromycin	Biaxin XL	7422	4172	
Epinephrine	Allerject	3222	2870	
Escitaloprim	Cipralex Meltz	4441		
Esomeprazole and naproxen	Vimovo	8343	99043	5217
Flucticasone and salmeterol	Advair	7328		
Flucticasone and salmeterol	Advair 100 Diskus		5006	
Flucticasone and salmeterol	Advair 125		5227	
Flucticasone and salmeterol	Advair Diskus	7601		
Gliclazide	Daimicron MR	3044		
Glycopyrronium	Seebri Breezhaler		4785	
Glycopyrronium and indacaterol	Ultibro Breezhaler			5376
Guanfacine	Intuniv XR		2922	
Iron	Feramax	3348	3468	2752
Methylphenidate	Biphentin		3790	3243

Methylphenidate	Concerta		3666	3802
Mometasone	Nasonex	3394		
Mometasone and formoterol	Zenhale	5359	5550	5624
Norethindrone acetate - ethinyl estradiol	Lolo		6513	7699
Oxycodone	OxyNEO	3014		
Oxycodone and naloxone	Targin	3718		
Pantoprazole magnesium	Tecta	8604	7615	3670
Perindopril	Coversyl Plus			3629
Quetiapine	Seroquel XR	3487		
Saxagliptin and metformin	Komboglyze	3478	3205	
Sitagliptin and metformin	Janumet	3590		
Sitagliptin and metformin	Janumet XR		5183	3359
Tiotropium	Inspiolto Respimat			2779
Tiotropium	Spiriva Respimat			5791
Trandolapril	Mavik	7436	6966	8104
Zolpidem	Sublinox	3633		

rating (PMPRB and/or Prescrire)

Moderate therapeutic gain	Little or no therapeutic gain
	1
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Appendix 2: Top Selling Dr

2013

Generic name	Brand name	Therapeutic rating (PMPRB and/or Prescrire)			Generic name	Brand name
		Major therapeutic gain	Moderate therapeutic gain	Little or no therapeutic gain		
Adalimumab	Humira			1	Adalimumab	Humira
Aripiprazole	Abilify			1	Aripiprazole	Abilify
Atorvastatin	Lipitor			1	Atorvastatin	Lipitor
Bevacizumab	Avastin			1	Bevacizumab	Avastin
Bortezomib	Velcade			1	Bortezomib	Velcade
Celecoxib	Celebrex			1	Celecoxib	Celebrex
Dabigatran	Pradaxa			1	Dabigatran	Pradaxa
Darbepoetin alpl	Aranesp			1	Darbepoetin alpha	Aranesp
Donepezil	Aricept	1			Duloxetine	Cymbalta
Duloxetine	Cymbalta			1	Escitaloprim	Cipralex
Dutasteride	Avodart			1	Esomeprazole	Nexium
Escitaloprim	Cipralex			1	Etanercept	Enbrel
Esomeprazole	Nexium			1	Ezetimibe	Ezetrol
Etanercept	Enbrel	1			Glatiramer	Copaxone
Ezetimibe	Ezetrol			1	Golimumab	Simponi
Glatiramer	Copaxone			1	Infliximab	Remicade
Imatinib	Gleevec	1			Interferon Beta-1A	Rebif
Infliximab	Remicade		1		Oxaliplatin	Eloxatin
Interferon Beta-1	Rebif		1		Perindopril	Coversyl
Oxaliplatin	Eloxatin			1	Ranibizumab	Lucentis
Perindopril	Coversyl			1	Rituximab	Rituxan
Pregabalin	Lyrica			1	Rivaroxaban	Xarelto
Ranibizumab	Lucentis	1			Rosuvastatin	Crestor
Rituximab	Rituxan	1			Sitagliptin	Januvia
Rosuvastatin	Crestor			1	Sofosbuvir	Sovaldi

Sitagliptin	Januvia	1	Tadalafil	Cialis
Tadalafil	Cialis	1	Tiotropium	Spriva
Tiotropium	Spriva	1	Trastuzumab	Herceptin
Trastuzumab	Herceptin	1	Ustekinumab	Stelara
Ustekinumab	Stelara	1		Advair 250 Diskus
				Therapeutic Eva
Budesonide and formoterol	Symbicort		Budesonide and formoterol	Symbicort
Dalteparin	Fragmin		Dalteparin	Fragmin
Efavirenz and emtricitabine and tenofovir	Atripla		Efavirenz and emtricitabine and tenofovir	Atripla
Emtricitabine and tenofovir	Truvada		Emtricitabine and tenofovir	Truvada
Epoetin alfa	Eprex		Epoetin alfa	Eprex
Filgrastim	Neupogen		Filgrastim	Neupogen
Flucticasone and salmeterol	Advair		Flucticasone and salmeterol	Advair 250
Flucticasone and salmeterol	Advair Diskus		Flucticasone and salmeterol	Advair 500 Diskus
Fluticasone	Flovent HFA		Fluticasone	Flovent HFA
Hydromorphon	Hydromorph Contin		Hydromorphone	Hydromorph Contin
Insulin glargine	Lantus		Insulin glargine	Lantus
Insulin glargine	Lantus Solostar		Insulin glargine	Lantus SoloStar
Methylphenidate	Concerta		Methylphenidate	Concerta
Oxycodone	OxyNEO		Oxycodone	OxyNEO
Pantoprazole magnesium	Tecta		Paliperidone	Invega Sustenna
Sitagliptin and metformin	Janumet		Pantoprazole magnesium	Tecta

Sitagliptin and metformin	Janumet

ugs by Dollar Amount, by Years

014					2015	
Therapeutic rating (PMPRB and/or Prescrire)			Generic name	Brand name	Therapeutic rating (PMPRB and/o	
Major therapeutic gain	Moderate therapeutic gain	Little or no therapeutic gain			Major therapeutic gain	Moderate therapeutic gain
		1	Adalimumab	Humira		
		1	Aflibercept	Eylea		1
		1	Aripiprazole	Abilify		
		1	Bevacizumab	Avastin		
		1	Dabigatran	Pradaxa		
		1	Darbepoetin alpha	Aranesp		
		1	Dimethyl fumarate	Tecfidera		
		1	Duloxetine	Cymbalta		
		1	Esomeprazole	Nexium		
		1	Etanercept	Enbrel	1	
		1	Golimumab	Simponi		
1			Infliximab	Remicade		1
			Lesipasvir and sofosbuvir	Harvoni		
		1				
		1	Liraglutide	Victoza		
		1	Lisdexamfetamine	Vyvanse		
	1		Omalizumab	Xolair		
	1		Oxaliplatin	Eloxatin		
		1	Perindopril	Coversyl		
		1	Ranibizumab	Lucentis	1	
1			Rituximab	Rituxan	1	
1			Rivaroxaban	Xarelto		
		1	Rosuvastatin	Crestor		
		1	Sitagliptin	Januvia		
		1	Sofosbuvir	Sovaldi	1	
1			Tadalafil	Cialis		

1	Tiotropium	Spriva
1	Trastuzumab	Herceptin
1	Ustekinumab	Stelara
1	Valacyclovir	Valtrex
		Advair 250

luation Not Available

Budesonide and formoterol	Symbicort
Dalteparin	Fragmin
Emtricitabine and tenofovir	Truvada
Epoetin alfa	Eprex
Filgrastim	Neupogen
Flucticasone and salmeterol	Advair 250 Diskus
Flucticasone and salmeterol	Advair 500 Diskus
Fluticasone	Flovent HFA
Hydromorphone	Hydromorph Contin
Insulin glargine	Lantus
Insulin glargine	Lantus SoloStar
Methylphenidate	Concerta
Oxycodone	OxyNEO
Paliperidone	Invega Sustenna
Pantoprazole magnesium	Tecta
Sitagliptin and metformin	Janumet

r Prescrire)
Little or no therapeutic gain
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