VIEWPOINT

Indication-Specific Pricing for Cancer Drugs

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In 2013, spending on specialty drugs, a category dominated by drugs used to treat cancer, totaled $73 billion.[1] That year, 8 new cancer drugs were approved by the US Food and Drug Administration (FDA). The Medicare "price," which includes patient co-insurance, for these 8 drugs ranged from $7000 to $12 000 per month,[2] with some products showing overall survival improvements of nearly 6 months and others showing no improvement in overall survival.

As policy makers consider how to handle high-priced drugs, an important concern is that the price of the drug is not currently linked to its benefits. "Value," the benefit of a treatment with respect to its cost, has become an increasingly important consideration, following some explicit models in Europe, where value is considered although not directly integrated into pricing. The UK National Institute for Health and Care Excellence (NICE) makes formulary determinations by considering effectiveness and cost together. It uses a common value threshold to determine which drugs qualify for inclusion. In Germany, the IQWIG (Institute for Quality and Efficiency in Health Care) uses a reference pricing system, whereby unless a new drug demonstrates superiority over the best existing comparator, it will be reimbursed at the same level as that comparator with any additional cost borne out-of-pocket by the patient.[3] This anchors only the portion of the price of the drug that is paid by the government to its value.

The American Society of Clinical Oncology recently announced that it will develop scorecards of different cancer treatments, ranking them by their benefits, adverse effects, and costs.[4] The National Comprehensive Cancer Network, a prominent publisher of cancer treatment guidelines, is also planning to publish treatment costs along with their conventional measures of treatment efficacy, toxicity, and the quality of the underlying clinical research data (Robert Carlson, MD, oral communication, September 4, 2014).

It is difficult to predict what changes in drug pricing might result from these European and US initiatives. Moving toward paying for drugs at prices that better match the benefits they deliver will be challenging. What is the right price for any particular level of benefit? How should benefit be determined? What if the condition is rare? What if the average benefit is small but a subgroup of patients derives a large benefit? Along with these frequently cited questions is a technical hurdle that has not been contemplated.

Most drugs for cancer, and for other life-threatening conditions, are used for multiple different indications with varying degrees of efficacy. Yet the prices of these drugs are fixed, making whatever value the drug delivers in one indication different from the value it delivers in another. This is illustrated in the **Table**, which shows several cancer treatments, their efficacy across a few of their FDA-approved indications , and their prices, both per month and for the typical duration of treatment for that indication.

For instance, nab-paclitaxel (Abraxane) improves median survival in metastatic breast cancer by 0.18 years, but the improvement in survival for metastatic non–small lung cancer (NSCLC) is less than half that (0.08 years). The treatment costs are similar for each indication, both per month and over the average duration of treatment. When costs are essentially the same but benefit differs widely, value is not the same. One crude metric of value is the cost per year of life gained. Using Medicare reimbursement rates, the cost per year of life gained with nab-paclitaxel is estimated at $145 000 in breast cancer and $400 000 in NSCLC, as measured by the change in median survival.

Linking pricing to the indication could address this substantial difference in value as measured by cost per year of life gained. One approach is to anchor all prices of a drug to the condition for which it provides the most value. Another approach would be to set all prices to achieve a preset value, such as $150 000 per year of life gained. Examples of indication-based pricing using each approach are shown in the Table.

For example, when the price of cetuximab (Erbitux) is linked to the indication for which it achieves the most value (locally advanced squamous cell carcinoma of the head and neck), the monthly price in its least effective indication (first-line treatment of recurrent or metastatic squamous cell carcinoma of the head and neck) would decline from $10 319 per month to $471 per month. For trastuzumab (Herceptin) (currently priced at $5412 per month), if the price is set to equate to $150 000 per year of life, the monthly price would increase substantially when used as an adjuvant treatment (to almost $25 000 per month) and would increase only slightly when used to treat metastatic disease (to $6000 per month).

The cost-benefit examples in the Table are crude. A thorough analysis would consider other costs, adjust survival gains to the mean experience rather than the median, and include adjustments for quality of life. However, the relative findings of large differences in value across indications, and large potential shifts in pricing if the drugs were linked to value, illustrate that a change to indication-based pricing may be a necessary step toward paying rational prices for expensive drugs used to treat cancer and some other conditions, for which efficacy varies across indications.

The health care system does not and cannot accommodate indication-based pricing. Oral agents for treating cancer, such as erlotinib (Tarceva), are distributed from pharmacies to patients. The parties that buy and then distribute these medications to pharmacies do so in bulk, and manufacturers do not know which patients are receiving their drugs for which indications. Pharmacies do not necessarily record the indication, even if the prior authorization process required by the insurer does. For drugs infused in the physician's office, prescribing physicians and hospitals sign contracts to purchase the

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Table. Comparison of Incremental Survival Improvement and Cost of Treatment for Several Cancer Drugs Across Different Approved Indications, Plus a Hypothetical Scenario in Which Price Is Set per Indication to Yield the Same Total Treatment Cost per Median Benefit (Indication-Specific Pricing)[a]

Drug and Indication	Median Survival Gain, y[b]	Typical Treatment Duration, mo	2014 US$				
			Typical Treatment Cost[c]	Cost per Year of Life Gained (Median)	Current Monthly Price	Monthly Price Based on Indication With Most Value[d]	Monthly Price Based on Achieving Value of $150 000 per Year of Life Gained
nab-Paclitaxel (Abraxane)							
Metastatic breast cancer	0.18[5]	4.16[7]	25 990	145 288	6255	6255	6458
Non-small-cell lung cancer	0.08	4.16	29 988	399 840	7217	2622	2708
Pancreatic cancer	0.15	4.00	27 065	180 433	6766	5448	5625
Erlotinib (Tarceva)							
First line treatment of metastatic non small-cell lung cancer	0.28	8.20	51 596	182 104	6292	6292	5183
Pancreatic cancer	0.03	3.90[6]	21 696	650 885	5563	1556	1282
Cetuximab (Erbitux)							
Locally advanced squamous cell carcinoma of the head and neck	1.64	1.39[7]	14 292	8706	10 319	10 319	177 798
First-line treatment of recurrent or metastatic squamous cell carcinoma of the head and neck	0.23	4.16	42 875	190 556	10 319	471	8123
Trastuzumab (Herceptin)							
Adjuvant treatment of breast cancer	1.99[8]	12.0	64 941	32 645	5412	5412	24 867
Metastatic breast cancer	0.40	10.0	54 118	135 294	5412	905	6000

[a] Data on survival gain and median treatment duration from the FDA label[9] and publications accompanying those studies.

[b] As per FDA package inserts or studies summarized therein (unless otherwise noted). Package inserts are available via drugs@FDA.[9]

[c] Only includes direct cost of the drug, as per http://www.mskcc.org/research/health-policy-outcomes/cost-drugs.

[d] Assumes the price of the drug in its most effective setting is the appropriate reference price.

drug from the manufacturer (or an intermediary) at a set price per milligram in a process not linked with the intended indication.

This system could be modified. Intermediaries, such as pharmaceutical wholesalers or pharmacies, could develop arrangements with manufacturers at agreed-upon prices for each indication, and drugs when sold could be appropriately allocated, with the appropriate charges and co-insurance attached. Prescribing physicians, either through prior authorization, as part of the prescription, or both, would report the indication for each patient. Categories for ordering, prescribing, price tracking, and reimbursement would be based on the drug with its indication, rather than the drug alone. For instance, for drugs dispensed by a pharmacy, the drugs would be linked to their intended use and price and co-insurance could be reconciled when the drug is dispensed. Infused drugs could be distributed and coded based on their indications, to accommodate the process of physicians and hospitals buying and then billing after the drug is administered.

Adopting indication-based pricing is thus technically feasible. Political challenges may be more substantial. The primary reason to pursue this enhancement to the system is to make it possible to rationalize drug pricing. There would be some secondary benefits, consistent with important current trends in health care toward more electronic documentation and richer data on health care encounters. The cancer care system would become more transparent with regard to the utilization of cancer drugs by physicians, and the data would create an infrastructure for real-world outcomes analyses as relevant information about indication could be captured as part of the clinician's workflow. Off-label prescribing could be identified, and outcomes data from those uses might be used to price those indications. Overall, the transparency of oncology care would be meaningfully enhanced, as the utilization of drugs and their indications would both be identified as a matter of routine care.

ARTICLE INFORMATION

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