Impact of Cost Sensitivity on Treatment Strategies for Type 2 Diabetes Mellitus

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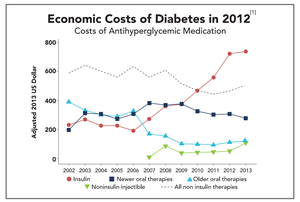
Defining the Complexity of Diabetes Treatment

The chronic, progressive nature of Type 2 Diabetes often requires multi-drug treatment regimens. In these cases, the patient and physician must balance efficacy, side effects, and complexity against the higher costs of multi-drug regimens when choosing a treatment.

To study these effects, data from abstracted charts of 200 primary care patients with Type 2 DM (a1c > 7) were obtained. Patient out-of-pocket diabetes medication costs for 3 insurance plans were obtained in addition to estimated retail price.

Decision support software was written to suggest appropriate treatment options at various monthly patient budgets. Results were examined in terms of:

- **The class of medication chosen for treatment of Type 2 Diabetes**
- **The cost of insuring patients with Type 2 Diabetes**



Cost and Complexity are Growing

Providers and patients are increasingly asked to manage the cost of therapy. Tiering of medications and coinsurance models ask patients to balance risk, benefit and cost. Samples and aggressive manufacturers coupons disrupt this balance. Cost to system is lost to complex contracting and rebates. Physicians are caught in between beneficence and distributive justice.

Decision Support Software Can Help

GlucosePATH analyzes every combination of 1 to 5 medications available to the patient.

AACE and ADA T2D Algorithms Can Help Too

AACE algorithm prioritizes therapies by balancing a broad spectrum of risks, benefits, and impact on pathophysiology.[2]

ADA algorithm provides open choices with a focus on total cost of drug.[3]

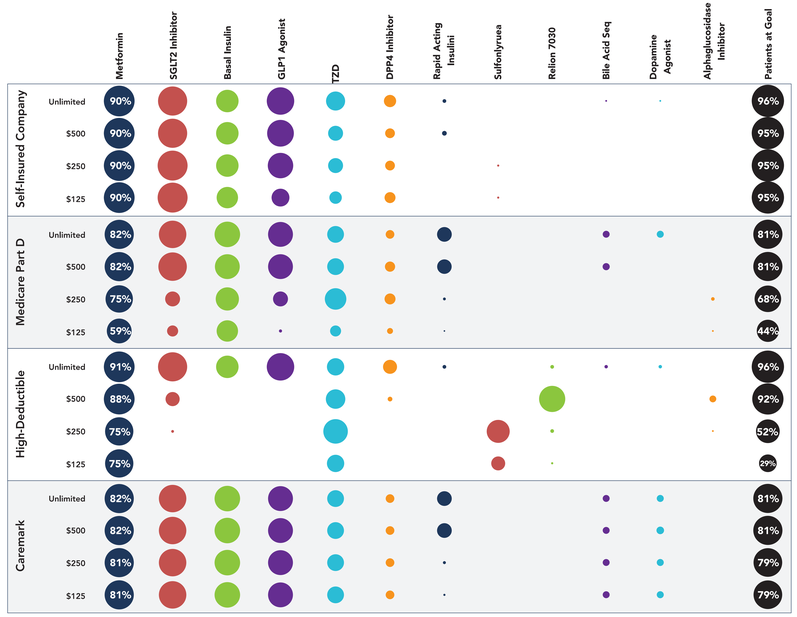
GlucosePATH leverage core values of AACE algorithm under the limitation of the drug cost to the patient.

GlucosePATH is currently in prospective clinical trials.

Data provided by Vericred, a healthcare data services company. Visit www.vericred.com for more information.

Budget + Coverage Determine Medication Classes

The chart below shows how frequently different medication classes are recommended in the four insurance coverage scenarios. Almost 1.5 billion treatment options were evaluated.



Cost Shifting Towards Patients Leads to Inequality

Modulation of maximal patient cost in traditional commercial insurance models makes relatively little difference, in part due to the presence of most classes in relatively affordable copay tiers. Manufacturer coupons further increase access to multiple branded medications.

The coinsurance style structure of Medicare creates strong differentials in prescribing dependent on the monthly budget of the patient. As monthly budget increases, drug regimens move towards medications with benefits beyond diabetes such as GLP1 agonists and SGLT2 inhibitors.

When cost of prescriptions is moved completely to patients, compromises come not only in terms of non-glucose related effect, but also in terms of hemoglobin A1c reduction. Most high risk patients could not reach projected control with monthly budgets of < $250/month.

More Information

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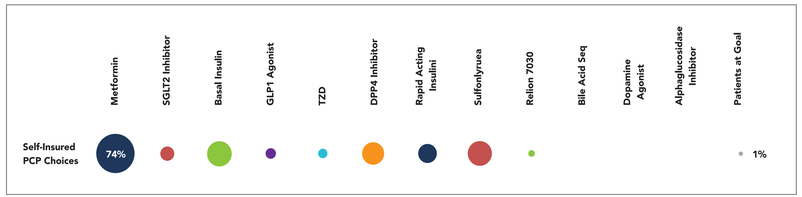
Better Outcomes at Lower Cost are Possible

The Self-Insured Company provided each T2D employee's latest physician-recommended medication regimen and a1c level, along with the company's co-pay amounts for each medication used. When combined with the employee's out-of-pocket cost for each medication, the total cost of each regimen could be calculated.

The medication classes for the physician recommendations are:

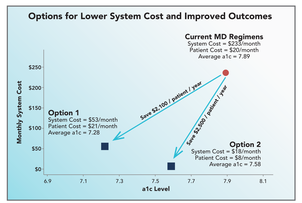


The impact of system cost can be measured in terms of drug cost + fees - rebates. With this information, decision software allows medications to be distributed more efficiently within a system.

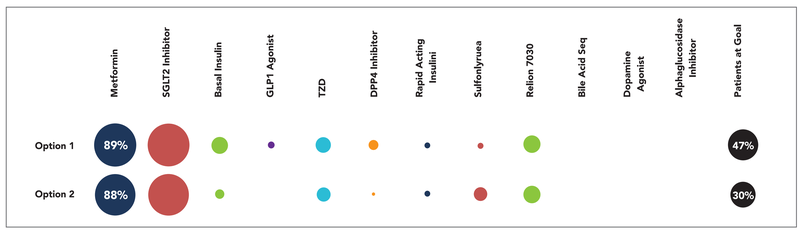
- Employees who can achieve goals with low cost drugs with few risks are treated with low budget impact
- This allows higher-cost drugs to be distributed to employees who benefit most
- Inefficient and low value interventions are excluded

Combined with individualized optimization, the IHI triple aim of improving the experience of care, improving the health of populations, and reducing per capita costs of health care can be achieved.

The Company could save more than $2,000 per T2D employee per year, in several scenarios:



Population Metrics (PATH)	Option 1 Averages	Option 2 Averages
A1c	7.22 (-0.67)	7.58 (-0.31)
System Cost per Month	$53 (-$180)	$18 (-$215)
Patient Cost per Month	$21 (+$1)	$8 (-$12)



[1] Hua, X., Carvalho, N., Tew, M., Huang, E. S., Herman, W. H., & Clarke, P. (2016). Expenditures and prices of antihyperglycemic medications in the United States: 2002-2013. Jama, 315(13), 1400-1402.

[2] Garber, A. J., Abrahamson, M. J., Barzilay, J. I., Blonde, L., Bloomgarden, Z. T., Bush, M. A., ... & Garber, J. R. (2017). Consensus statement by the American association of clinical endocrinologists and American College of Endocrinology on the comprehensive type 2 diabetes management algorithm–2017 executive summary. Endocrine Practice, 23(2), 207-238.

[3] American Diabetes Association. (2017). 8. Pharmacologic Approaches to Glycemic Treatment. Diabetes Care, 40(Supplement 1), S64-S74.