

Discussion: ODYSSEY (Cost)

Andrew Moran, MD, MPH

 **COLUMBIA**

**COLUMBIA UNIVERSITY
IRVING MEDICAL CENTER**



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Background: Cost-effectiveness

Cost-Effectiveness Analysis

Do new treatments gain health at a reasonable cost to society and to healthcare payers?

Incremental cost-effectiveness ratio (ICER): Metric to assess cost-effectiveness – cost to gain one year of quality-adjusted life (QALY)

$$\text{ICER} = \frac{\text{Cost}_2 - \text{Cost}_1}{\text{QALY}_2 - \text{QALY}_1}$$

Time horizon: Cost effectiveness of chronic treatments should be assessed within the trial observation period AND over patients' lifetimes*

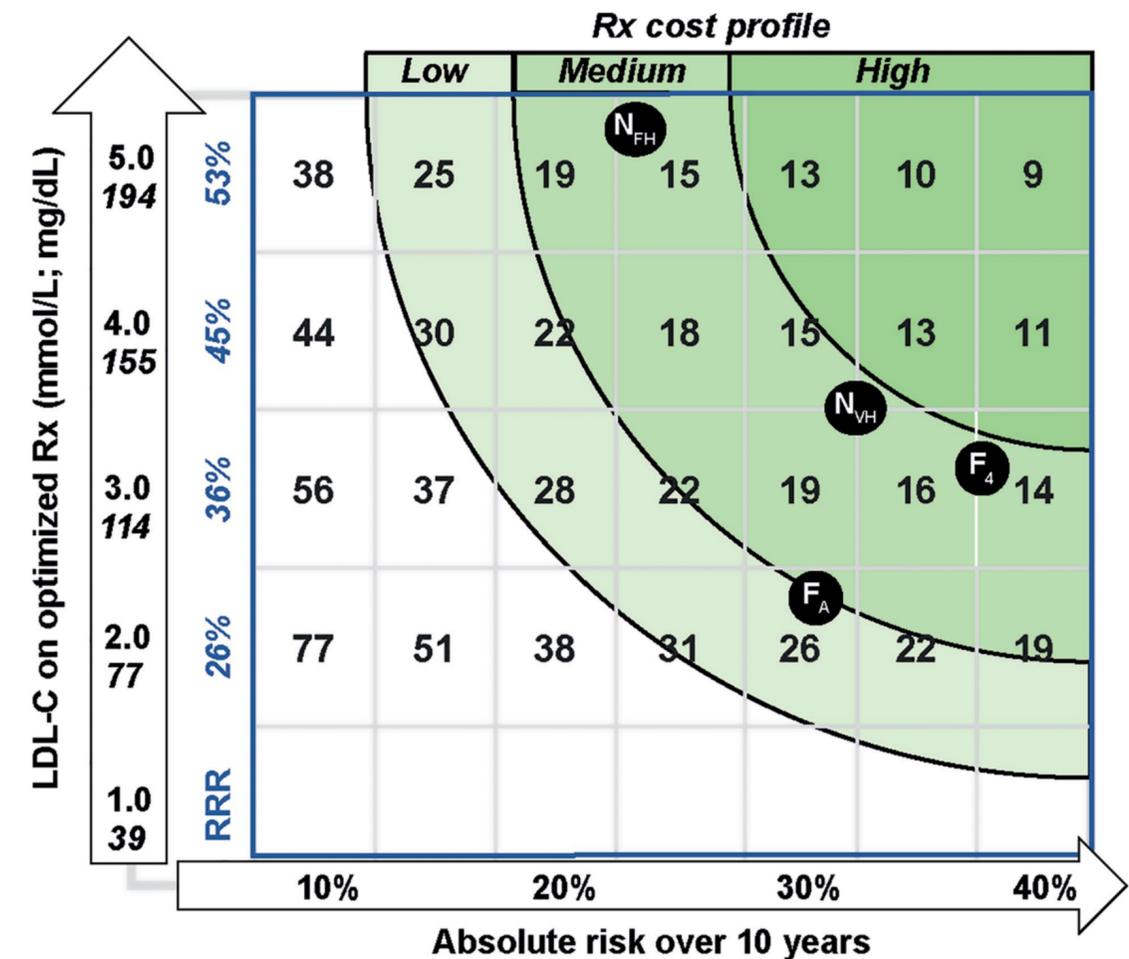
Willingness to pay (WTP): How much is the payer willing to invest in the new treatment to gain health? *Commonly accepted thresholds in the US range from \$50,000-\$150,000 per QALY gained.*

*Ramsey S, et al., Value in Health, 2005



ODYSSEY (Cost): Strengths

- Data on efficacy, health-related quality of life, healthcare utilization all based on values *measured directly* in the ODYSSEY-Outcomes trial
- Standard approach to *post-acute coronary syndrome survival projections* to model expected lifetime QALYs in active and placebo arms
- *Focus on “value based cost”* in overall and subgroup analyses (Figure): setting a price point cost-effective for highest benefit patients could incentivize appropriate prescribing & disincentivize low-value prescribing



‘Highest risk–highest benefit’ strategy for proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitor use. From: Annemans et al., European Heart Journal, 2018



ODYSSEY (Cost): Weaknesses

(Based on cost-effectiveness analysis best practices recommendations)*

- Not all costs considered: Exclusion of non-cardiovascular disease background costs is *not* conservative
- All-cause mortality was a secondary outcome in ODYSSEY-Outcomes [CVD mortality effect relatively weaker (12% reduction, NS); driver of statistically significant 15% all-cause mortality benefit unclear & confidence interval wide]
- All-cause mortality by LDL-C subgroup was not a pre-specified analysis
- Full ODYSSEY (Cost) report will require:
 - Complete cost-effectiveness outcomes (Δ total costs, Δ total QALYs)
 - Reporting on uncertainty – especially treatment effects and survival
- Potential “disutility” (inconvenience) of lifelong biweekly injections

*Sanders GD et al., JAMA, 2016; Ramsey S et al., Value in Health, 2005



ODYSSEY (Cost): Take Home 1

- Remaining questions:
 - Will the ODYSSEY (Cost) economic outcomes be robust when uncertainty is considered [*e.g., 95% CI of main effect, hazard ratio for all-cause mortality (0.73-0.98)*] ?
 - What summary cost-effectiveness estimate (ICER) will be reported for the U.S., and based on what U.S. drug price?
- Patient preferences, perspectives, and costs need consideration
 - Convenience of biweekly dosing versus patient acceptance of a life-long injectable agent must be explored
 - Past patient-centered experience with insulin, other injectable anti-diabetics and biologics can be considered



ODYSSEY (Cost): Take Home 2

- Currently, few patients have had access to PCSK9i—due to out-of-pocket costs and other barriers (*inset on right*)
- Rarely has cost-effectiveness analysis had an impact on CVD drug pricing as with PCSK9i: Manufacturers recently slashed U.S. prices
- Past economic analyses of PCSK9i trials set value-based prices (at WTP \$100,000/QALY) ranging from \$4,000 to \$9,000 annually*
- Institute for Clinical and Economic Review recommended alirocumab price, based on ODYSSEY-Outcomes (WTP \$100,000/QALY):**
 - \$5,300 if baseline LDL-C >100 mg/dl
 - \$2,300 all eligible (baseline LDL-C >70 mg/dl)

The New York Times

These Cholesterol-Reducers May Save Lives. So Why Aren't Heart Patients Getting Them?

Powerful PCSK9 inhibitors were supposed to revolutionize care for cardiac patients. But insurers and other payers balked at sky-high prices.

Gina Kolata, NY Times, October 2, 2018

*Hlatky and Kazi, JACC, 2017

**<https://icer-review.org/announcements/alirocumab-prelim-evidence-update/>



THANK YOU!



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