

Case Study

Cost of Biologics in the Oncology Care Model and Initiatives in Dose Banding and Dose Rounding

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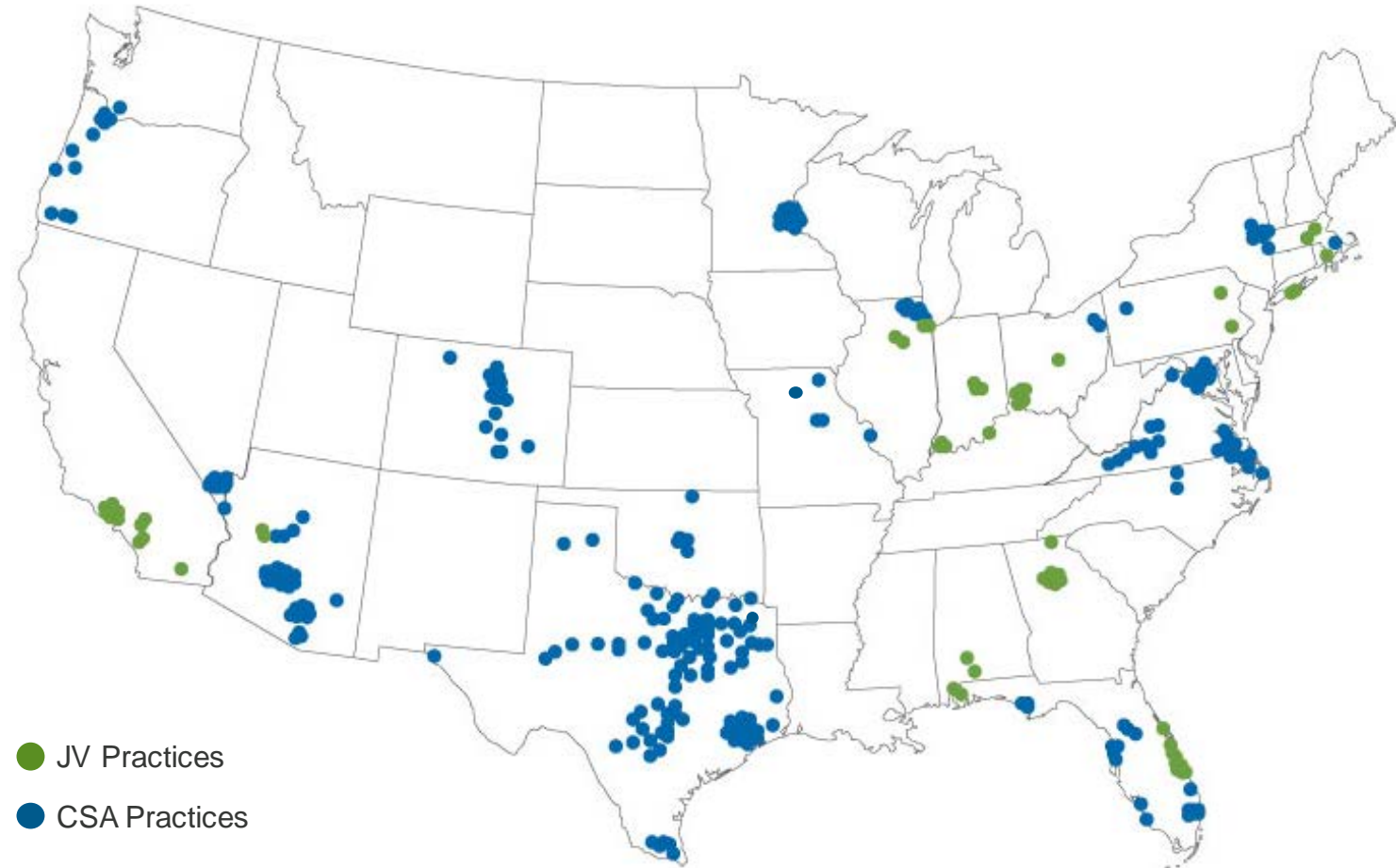
The US Oncology Network Overview

National Reach

- >400 sites of care in 28 states
- ~1,500 physicians
- >850K patients treated annually

Innovative Clinical Care

- Leader in value based care
- Majority of our practices are in OCM and on 2-sided risk
- 85% of The Network physicians participating in OCM
- Moved to dose banding in 2018 due to OCM and some dosing vial size changes



Vial size impacts costs



\$4,500

For **multiple** doses



\$5,700

For **single** dose



KEYTRUDA[®]

(pembrolizumab) Injection 100 mg

Dose used following
Original Weight-Based

\$7316



Single Flat Dose (200mg)

\$9724.08

Medicare Allowable (ASP+4.3%) as of July 2017



Keytruda transition from 2mg/kg to 200mg flat dose

Pros and Cons of Flat Dosing

Pros	Cons
Less time in preparation	More drug wastage and costs
Less risk of error in preparation	More risk to provider practices who are moving more to total cost of care models
Need only one or limited vial sizes	
Less chance of prescribing error	
Largely eliminates need for multi-dosing vials	
Reduces the risk of contamination or improper storage due to only single dose vials	

Clinical Evaluation of Fair Dosing for Pembrolizumab

Dosing Strategy	Relative Cost	AUC Impact
2mg/kg	100%	
Dose banding	85%	-1%
Fixed 150mg	75%	-5%
Fixed 200mg	107%	+27%
PK derived dosing	84%	+3%

Ogunbendro K, Patel A, Duncombe R, , Nutall, Clark J, Lorigan P.

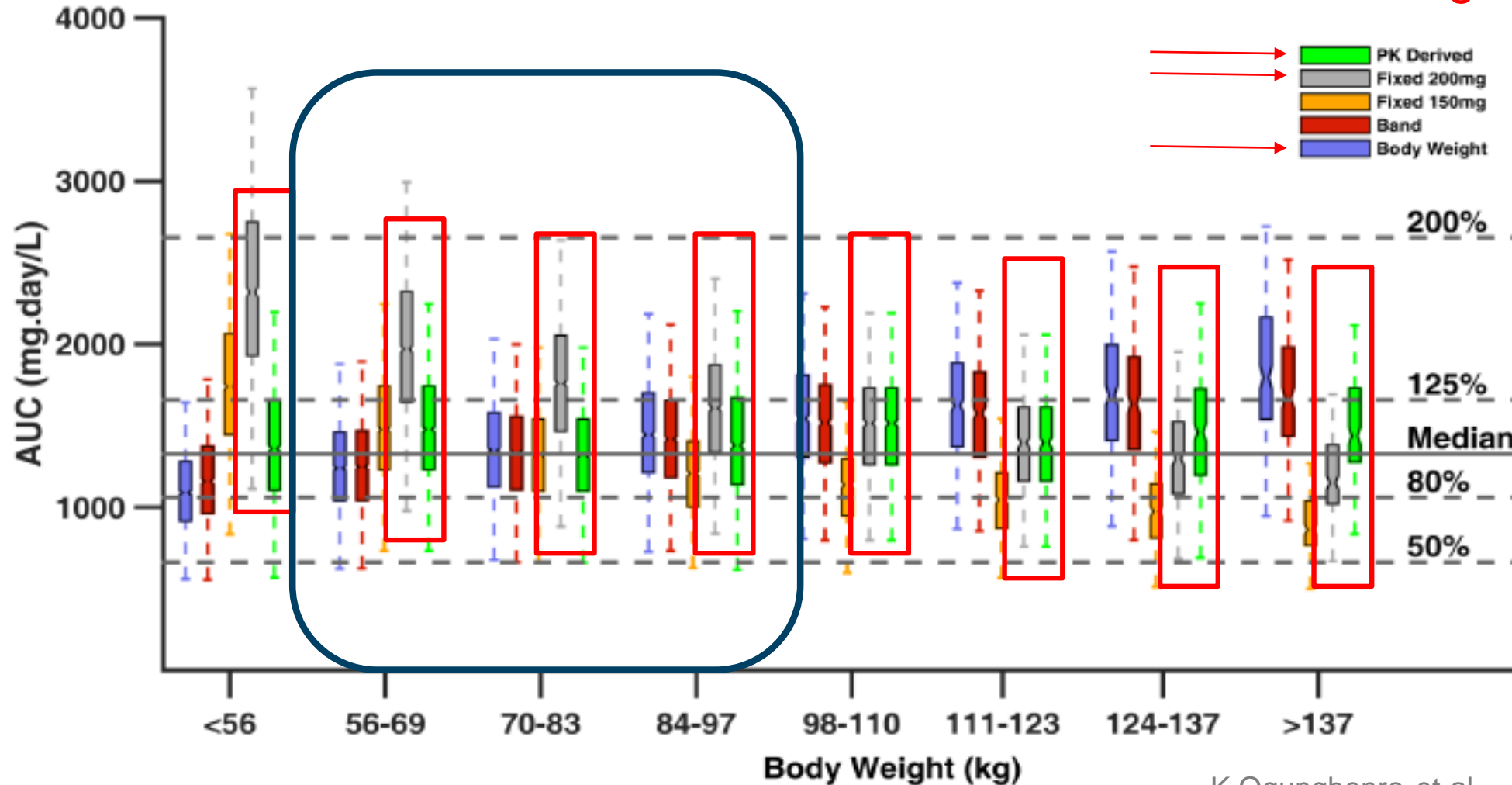
Dose Rationalization of Pembrolizumab and Nivolumab Using Pharmacokinetic Modeling and Simulation and Cost Analysis.

[Clin Pharmacol Ther.](#) 2018 Apr;103(4):582-590.



Clinical Evaluation of Fair Dosing Pembrolizumab

PK derived dosing has similar drug exposure to both mg/kg dose and fixed 200 mg dose



Keytruda Vial size in the US is 100mg

75% of US Oncology patient in the weight range

100mg
(<50kg)



150mg
(51-90kg)



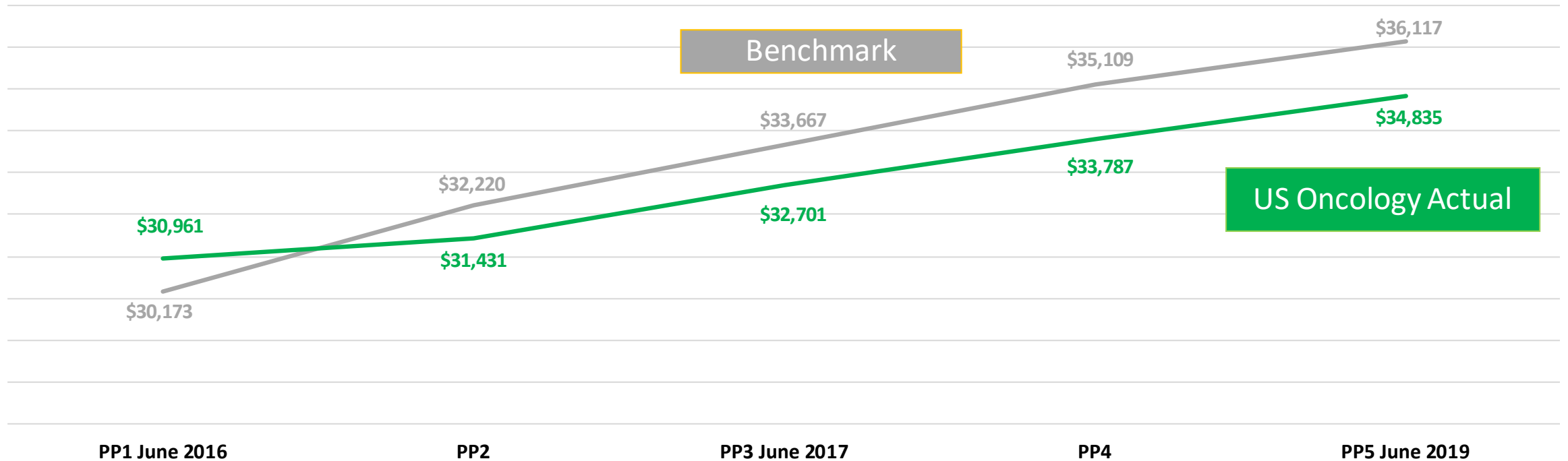
200mg
(>90kg)



- Note 50mg vial size available in Europe but not in the US

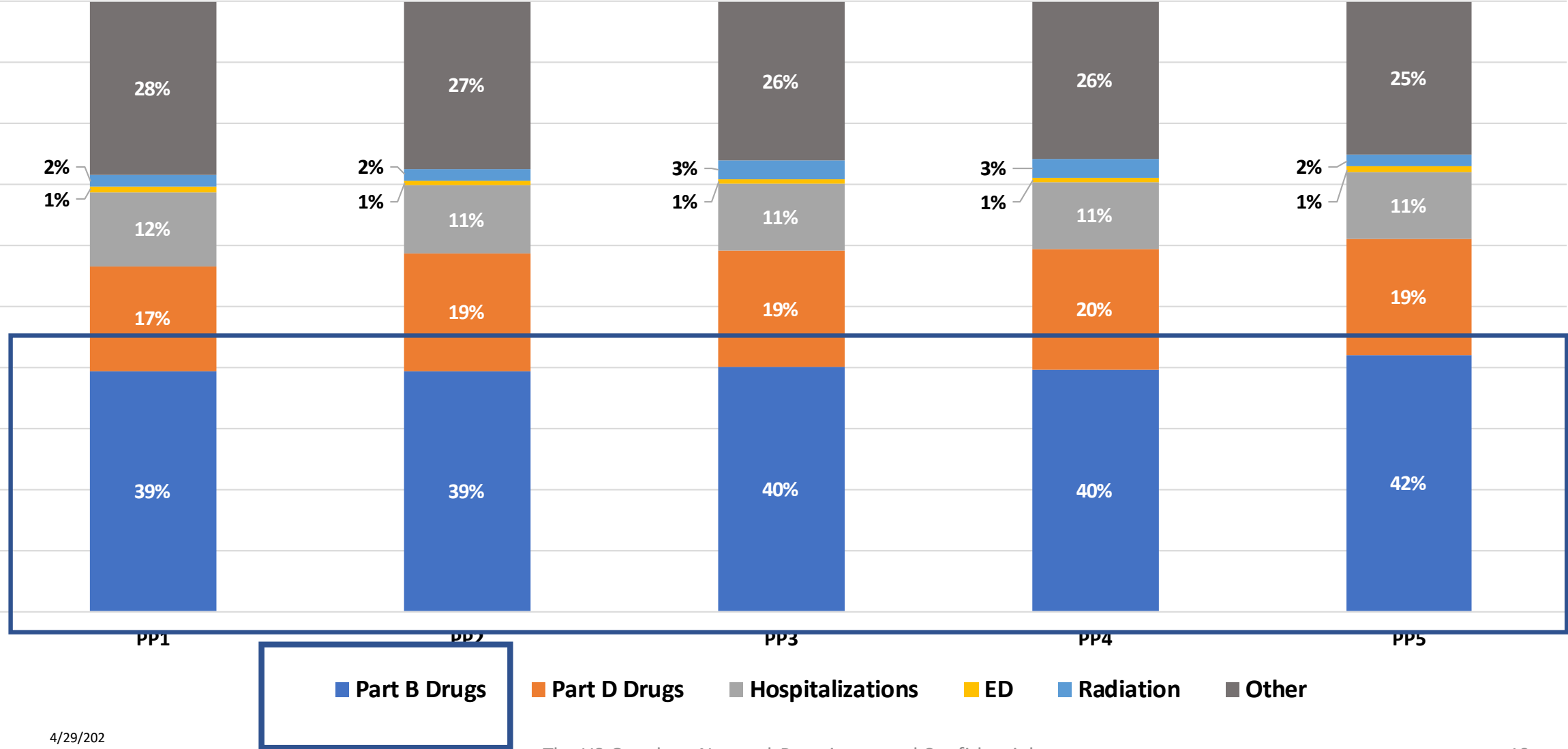


Oncology Care Model Total Cost per Episode

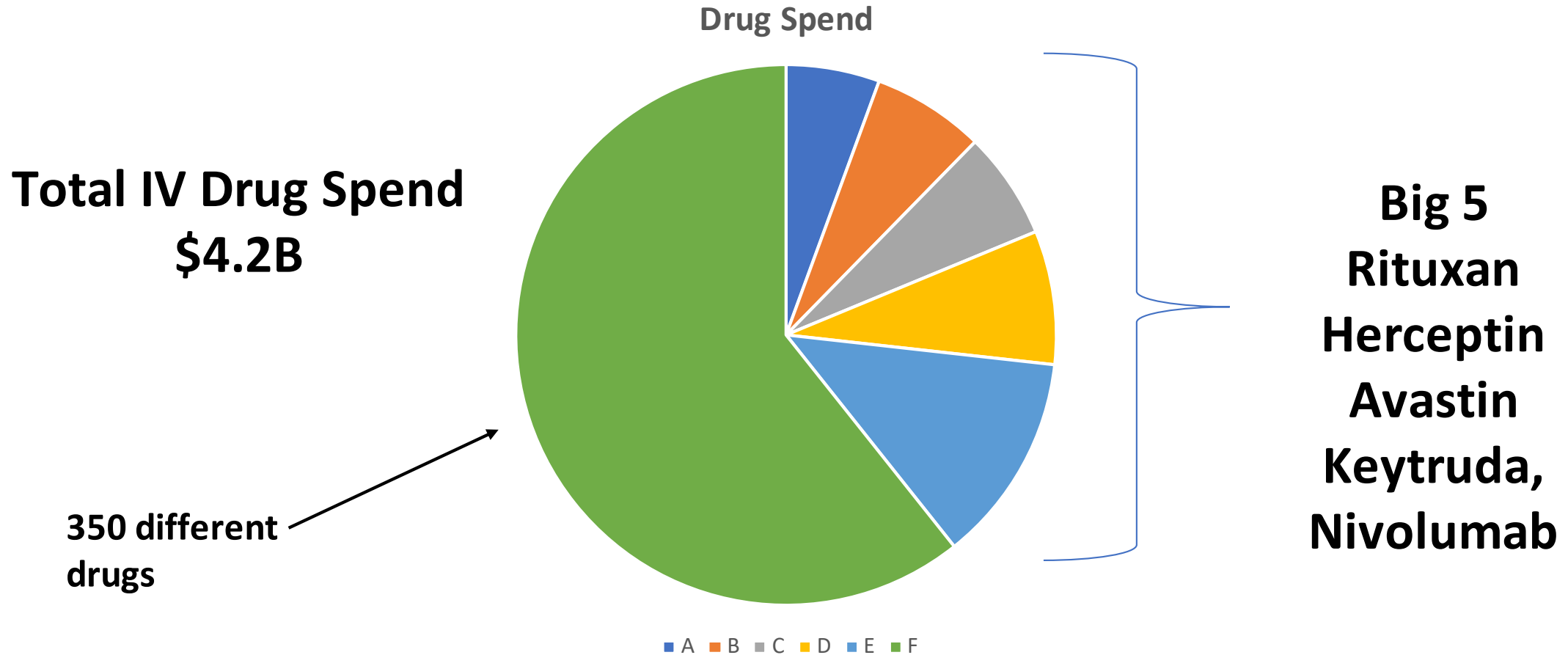


Beating the Benchmark indicates that the Network had total cost of care savings, even after receiving MEOS benefits

OCM Total Cost of Care (%)



IV Drug Spend (all payers) US Oncology 2019



Summary

‘Fair Dosing’ is the right strategy to adopt and win in value-based care

- Fair Dosing = Dose Banding + Dose Rounding+ Dose Splitting
 - Due to limited vial sizes split dosing of biologics is challenging
- Vial and dosing changes has increased drug waste and cost by 10-40%
- US Oncology had about \$50M in billed waste last year

