Banking Cost Savings with Biosimilars

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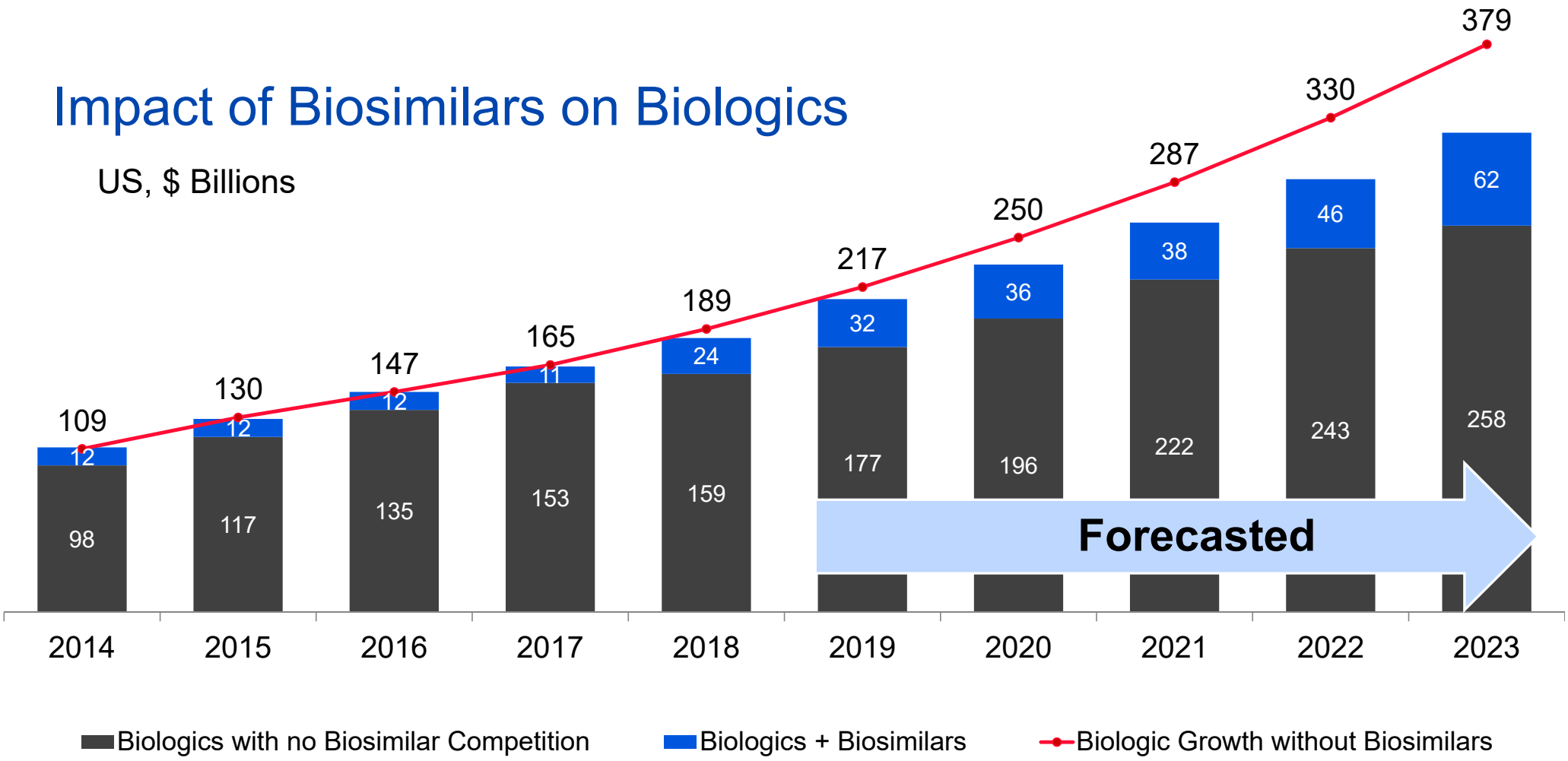
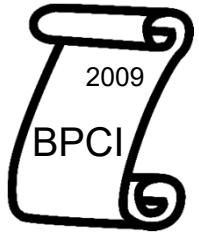
Impact of Biosimilars on Biologics



IQVIA MIDAS, Jun 2018, Institute Dec 2018.
Lexchin, J. (2020) *JAMA*;3(4):e2204753

Learning Objectives

- Review pharmacoeconomic effects of biosimilar incorporation into clinical practice
- Identify clinical areas where implementation of biosimilars may be most cost-effective
- Evaluate literature reviewing clinical outcomes for patients transitioned to biosimilar agents



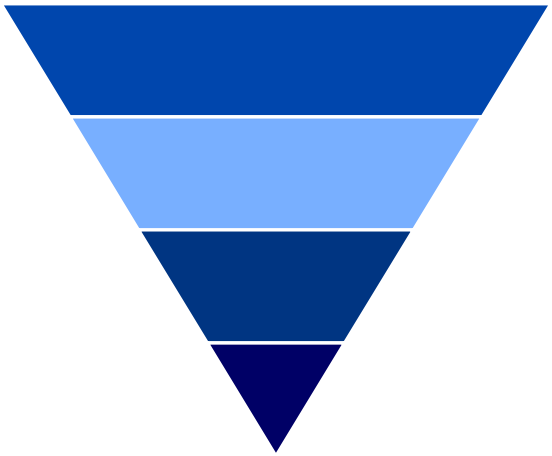
Introducing Biosimilars

- Biologic Price Competition and Innovation Act of 2009
- Fastest-growing class of therapeutic products in the US
- Increases access to treatment
- Generally large, complex molecules produced by live cells

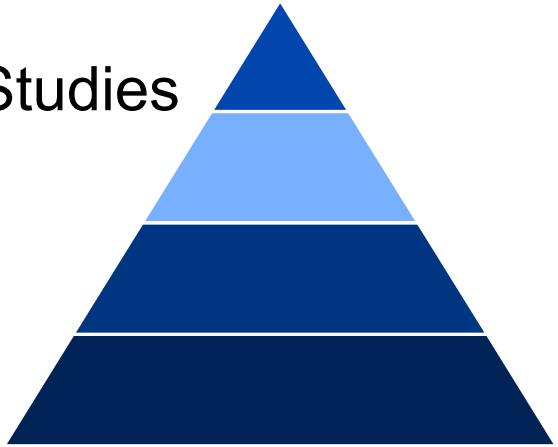
"…is highly similar to the reference product notwithstanding minor differences in clinically inactive components, and there are no clinically meaningful differences between the biosimilar product and the reference product in terms of safety, purity and potency"

US Food and drug Administration, Center for Biologic Evaluation and Research (CBER). Scientific Considerations in Demonstrating Biosimilarity to a Reference Product. Guidance for Industry. (2015)

Reference Product



Biosimilar



True of False: Biosimilar products are interchangeable with the reference biologic?

A. True

B. False

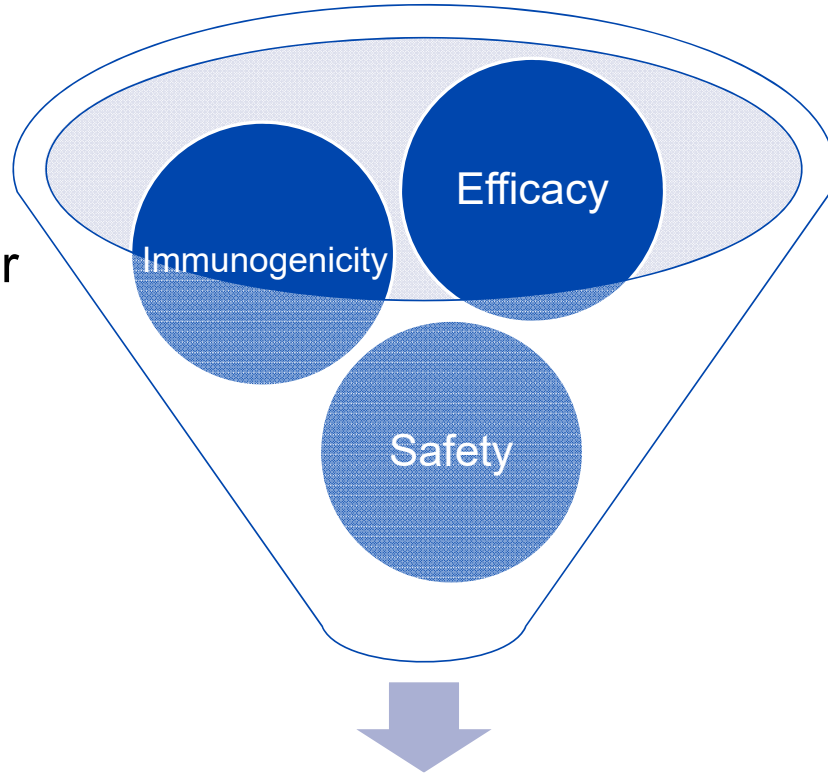
True of False: Biosimilar products are interchangeable with the reference biologic?

A. True

B. False

Extrapolation and Interchangeability

- Extrapolation:
  - Grants FDA Approval based on evidence for an indication held by reference product without indication-specific clinical trials
  - Justified based on the similarity demonstrated between products
    - Mechanism of Action
    - Pharmacokinetics
    - Pharmacodynamics



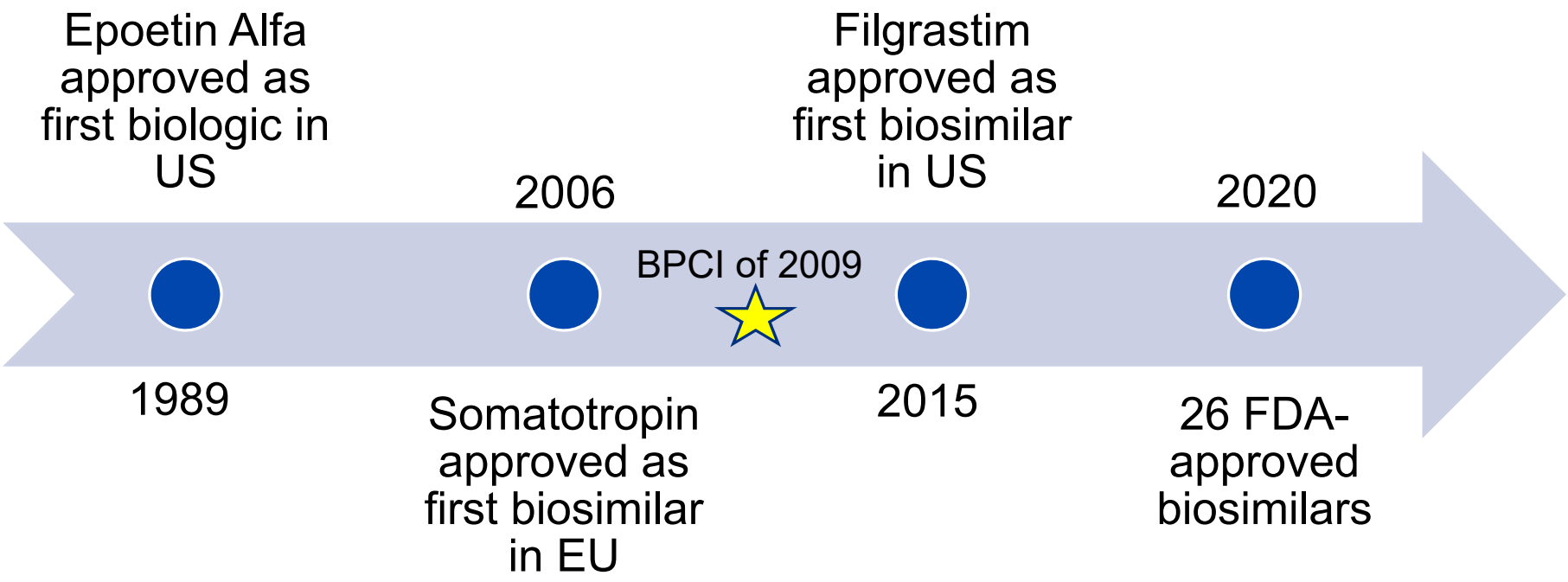
Extrapolation of Indication

Extrapolation and Interchangeability

- Interchangeability:
  - Biosimilar may be substituted for the reference product without healthcare provider intervention
  - Must show biosimilarity to reference product
  - Additional data needs to show that clinical results are the same as reference product in any given patient.
  - Low risk in terms of safety/efficacy when alternating or switching between products

Teva Pharmaceuticals USA, Inc. (2018). Biosimilars: Uniquely Similar

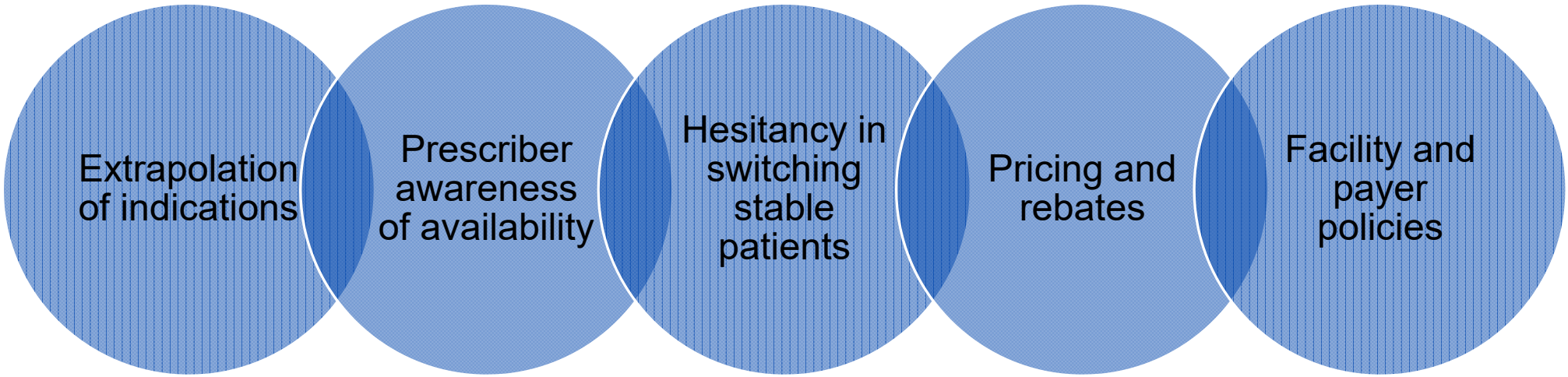
Biologics and Biosimilars Timeline



Sandoz (2017). Improving access to biologic medicines through biosimilars
FDA (2020). Biosimilar Product Information. FDA-approved biosimilar products

BPCI = Biologic Price Competition and Innovation Act

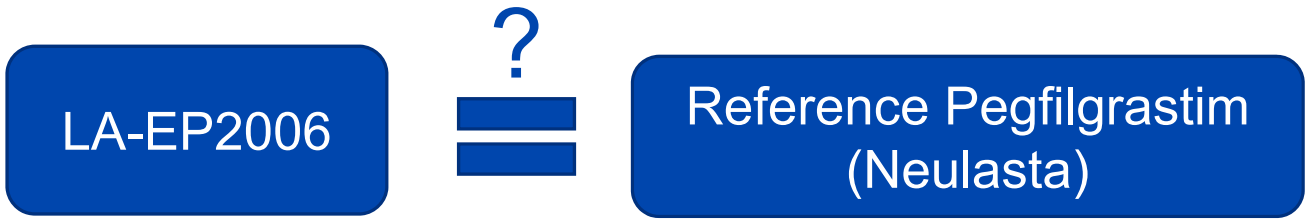
Growing Pains with Biosimilars



Davio, K. (2019) Rheumatologists' Biosimilar Awareness. *AJMC*
Soefje, S. (2020) Connecting Players – Strategic Decision-making to Serve the Patient Journey. Specialty Therapies and Biosimilars Congress

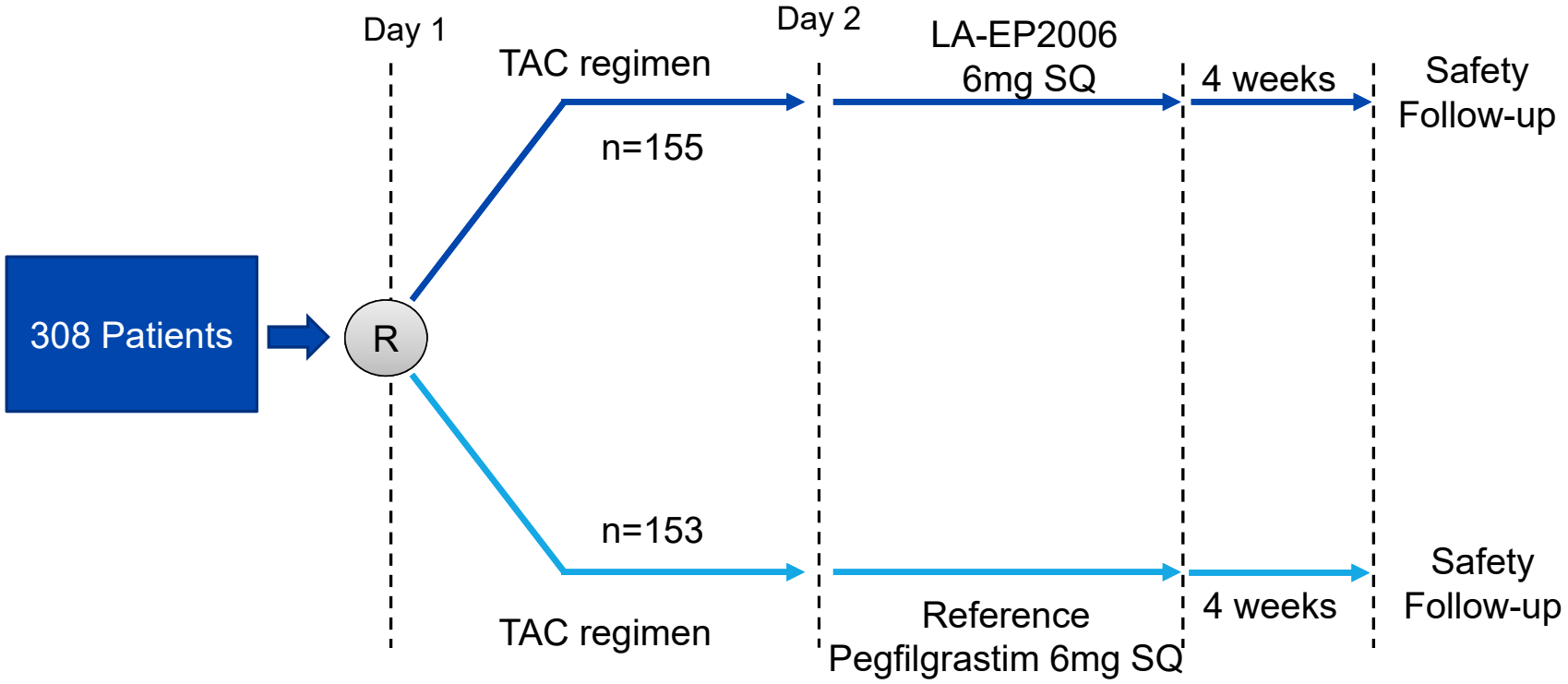
PROTECT-2 Trial

- Pegfilgrastim biosimilar, LA-EP2006 comparative treatment evaluation
- Phase III, multicenter, randomized, double-blind clinical trial
- Early-stage breast cancer patients receiving myelosuppressive chemotherapy
- Primary outcome: duration of severe neutropenia (DSN) during cycle 1



Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

PROTECT-2



Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

TAC regimen:
Docetaxel 75mg/m^2
Doxorubicin 50mg/m^2
Cyclophosphamide 500mg/m^2

PROTECT-2 Baseline Characteristics

Characteristic	LA-EP2006 (n=155)	Reference (n=153)
Age, years, mean ± SD	48.8 ± 10.5	49.1 ± 10.07
BMI, kg/m^2, mean ± SD	26.56 ± 5.771	26.49 ± 5.126
Starting chemotherapy dose, mg, mean ± SD		
Doxorubicin	84.0 ± 10.98	84.9 ± 9.96
Cyclophosphamide	838.8 ± 114.73	849.9 ± 99.44
Docetaxel	126 ± 17.21	127.5 ± 15.28
ECOG performance status, *n* (%)		
0	117 (75.5)	110 (71.9)
1	36 (23.2)	43 (28.1)
2	2 (1.3)	0

Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

PROTECT-2 Results

	Full analysis set		Per-protocol set	
	LA-EP2006 (n=155)	**Reference (n=153)**	**LA-EP2006 (n=148)**	**Reference (n=144)**
DSN in cycle 1, days				
Mean ± SD	1.36 ± 1.133	1.19 ± 0.984	1.34 ± 1.141	1.19 ± 0.991
Median (min-max)	1.00 (0.0-6.0)	1.00 (0.0-4.0)	1.00 (0.0-6.0)	1.00 (0.0-4.0)
Treatment difference	-0.16		-0.15	
90% CI	-0.36 to 0.04		0.35 to 0.06	
95% CI	-0.40 to 0.08		-0.39 to 0.10	

Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

DSN = Duration of Severe Neutropenia

PROTECT-2 Results

- Secondary endpoints

	Cycle 1 (FAS)		All cycles (FAS)	
Patients, *n* (%) with at least one occurrence of:	LA-EP2006 (n=155)	Reference (n=153)	LA-EP2006 (n=155)	Reference (n=153)
Febrile neutropenia (FN/NS)	12 (7.7)	15 (9.8)	16 (10.3)	20 (13.1)
Fever episode	13 (8.4)	17 (11.1)	32 (20.6)	35 (22.9)
Infections	10 (6.5)	14 (9.2)	26 (16.9)	32 (20.9)

- Mean number of days to ANC recovery was similar for LA-EP 2006 (2.11 ± 0.89) and reference (2.04 ± 0.95)

Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

FN = febrile neutropenia
NS = neutropenic sepsis
FAS = full analysis set

PROTECT-2 Results

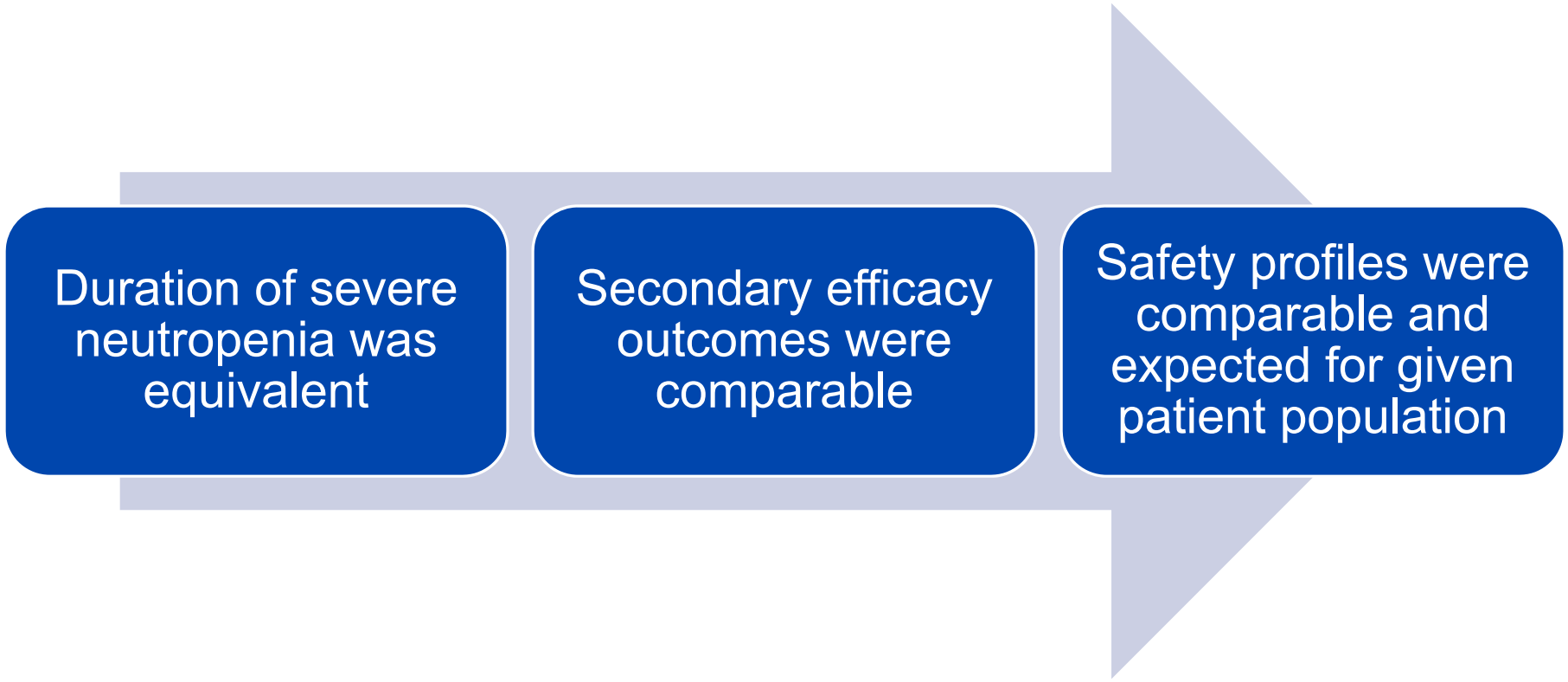
- Safety endpoints were similar between the two groups

Event, *n* (%)	LA-EP2006 (n=155)	Reference (n=153)
Any TEAE	149 (96.1)	146 (95.4)
Pegfilgrastim-related TEAE	52 (33.5)	43 (28.1)
TEAE resulting in pegfilgrastim reduction/interruption	10 (6.5)	5 (3.3)
TEAE leading to pegfilgrastim discontinuation	4 (2.6)	5 (3.3)
TEAE leading to death	3 (1.9)	2 (1.3)
Grade 3/4 TEAE	83 (53.5)	79 (51.6)

Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

TEAE = treatment-emergent adverse event
D/C = discontinuation

PROTECT-2 Conclusion



Blackwell, K., et al. (2016). *Oncologist*.(7):789-94

Pegfilgrastim prophylaxis – McBride 2020

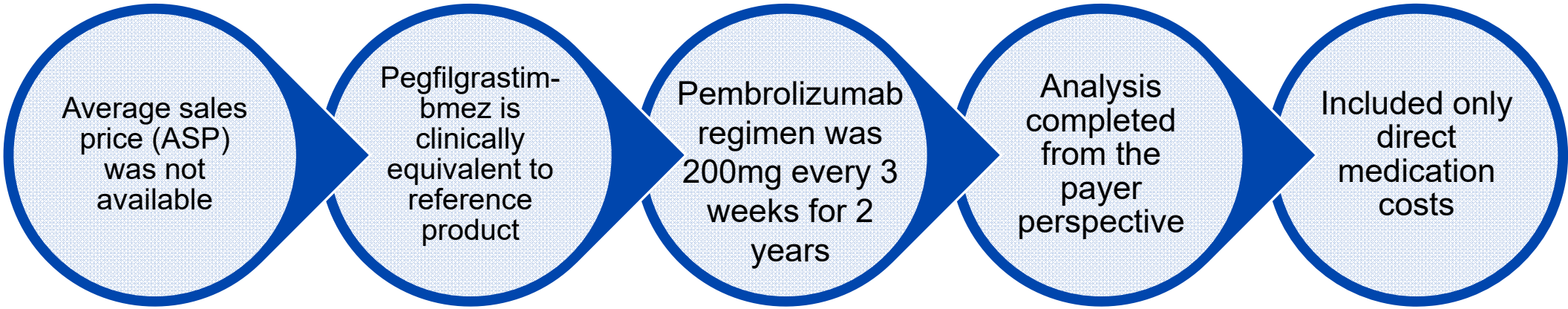
- Pegfilgrastim-bmez (Ziextenzo) was FDA-approved in November 2019
- *ex ante* economic evaluation
- Developed 3 sequential simulated models

1. Direct savings accrued by conversion
2. Estimated number of patients who would be provided one cycle of prophylaxis on a budget-neutral basis
3. Estimated number of patients who could be provided access to pembrolizumab to treat NSCLC on a budget-neutral basis

McBride, A., (2020) *J Med Econ*. 1-8. [Epub ahead of print]

NSCLC = Non-small cell lung cancer

McBride 2020 – Assumptions



McBride, A., (2020) *J Med Econ*. 1-8. [Epub ahead of print]

McBride 2020 – Average Sale Price Inputs

Neulasta

- $4,249.81 per 6mg dose

WAC = $6,231

Pembrolizumab

- $9,470 per 200mg dose
- $328,312 per 2-year regimen

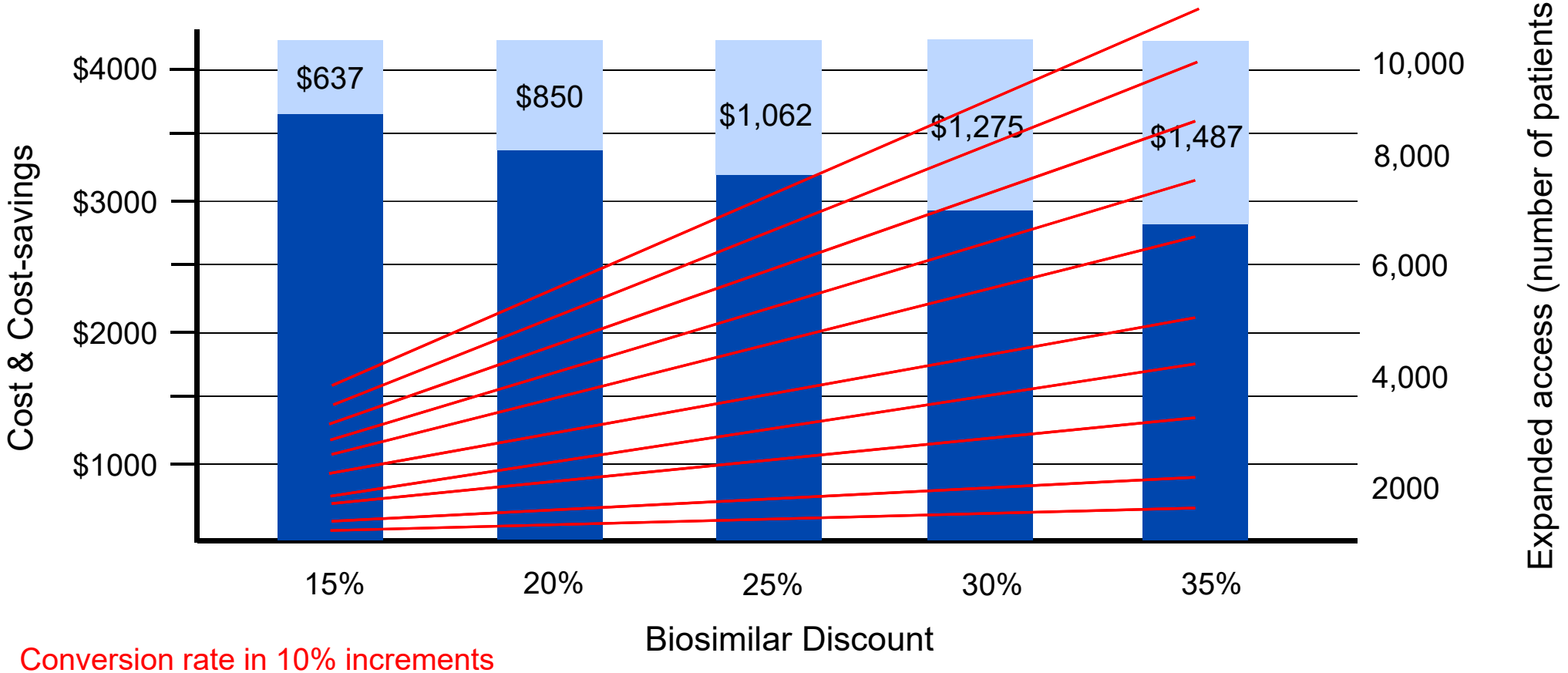
Pegfilgrastim-bmez

- Assumed cost:
- 15% off = $3,612
- 20% off = $3,400
- 25% off = $3,187
- 30% off = $2975
- 35% off = $2,762

WAC = $3,925

McBride, A., (2020) *J Med Econ*. 1-8. [Epub ahead of print]

Direct Savings Accrued By Conversion – PCPP



Conversion rate in 10% increments