EMPLOYING BAYESIAN-CALIBRATED MICROSIMULATION TO ASSESS THE COST-EFFECTIVENESS OF LONG ACTING INJECTABLE BUPRENORPHINE VERSUS SUBLINGUAL BUPRENORPHINE TO TREAT OPIOID USE DISORDER

Carter JA[1], Dammerman R[2], Frost M[3], and Tiberg F[4]

[1]EPI-Q Inc, [2]Braeburn Pharmaceuticals, [3]Eagleville Hospital, Camurus AB[4]

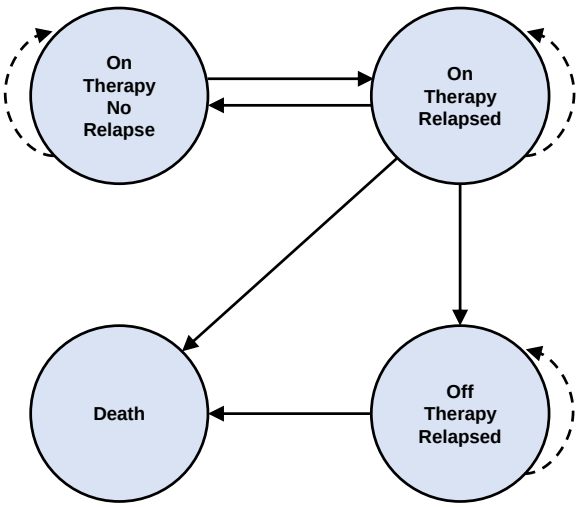
BACKGROUND / OBJECTIVE

- Sublingual buprenorphine (SL-BPN) is used to treat opioid use disorder (OUD), but is frequently abused or diverted[1].
- Without medication-assisted treatment, patients are prone to treatment failure, which is associated with costly healthcare and societal consequences[2].
- Flexible (i.e., monthly or weekly), depot, injectable buprenorphine (FDI-BPN) is an abuse-deterrent formulation undergoing market authorization in the US and elsewhere.
- FDI-BPN demonstrated non-inferiority versus SL-BPN in a 24-week Phase 3 clinical trial enrolling 428 patients with OUD[3].
- Given the high economic burden of opioid misuse in the United States we sought to assess the health-economic benefits of FDI-BPN from a US societal perspective.

METHODS

- We simulated progression of individual patients through a 4-state Markov model (**Fig 1**) while undergoing treatment for OUD with either FDI-BPN or SL-BPN.
- Patients accumulated direct medical costs of emergency room, hospitalizations, and rehabilitation services, and pediatric poisonings and non-medical costs of criminality and lost wages/work-productivity.
- Bayesian calibration was used to model individual patient histories based on background characteristics reported in the trial, and reconcile these characteristics with transition probabilities and event rates.

Fig 1. Markov Model Structure



METHODS (CON'T)

- Outcomes from the 24-week trial were modeled out to 52 weeks, cycled weekly.
- Sensitivity analysis was used to assess model specifications.

RESULTS

- FDI-BPN was associated with fewer patients relapsing while on treatment as measured by urinalysis, lower overall mean proportion of urines positive for illicit opioids, and similar retention compared to SL-BPN.
- These benefits translated into lower total costs at 52 weeks: FDI-BPN = $34,604 vs SL-BPN = $40,002 (**Table 1**).
- Key cost components included direct medical costs attributable to ER and hospitalization and non-medical costs attributable to criminal justice.

Table 1. Comparison of Modeled Annual Costs

Component	FDI-BPN	SL-BPN	Difference
Direct Medical Costs	**$ 29,785**	**$ 34,606**	**$ (4,821)**
ER and Hospitalization	$ 27,837	$ 32,336	$ (4,499)
Rehabilitation Services	$ 1,948	$ 2,262	$ (314)
Pediatric Poisonings	$ -	$ 8	$ (8)
Non-Medical Costs	**$ 4,819**	**$ 5,396**	**$ (577)**
Criminal Justice	$ 4,760	$ 4,925	$ (165)
Lost Wages and Productivity	$ 59	$ 471	$ (412)
TOTAL ANNUAL COSTS	**$ 34,604**	**$ 40,002**	**$ (5,398)**

CONCLUSIONS

- FDI-BPN was associated with lower direct medical and non-medical costs versus SL-BPN.
- Outcomes may be underestimated given that the double-blind double-dummy trial design may have attenuated differences in retention that may be observed in a real-world setting.
- Additionally, we have included only a narrow set of cost components that were analyzable with the limited clinical data currently available.
- Findings should be interpreted carefully as model components were drawn from multiple sources.
- Nevertheless, FDI-BPN offers an opportunity to improve OUD clinical outcomes and reduce the economic burden of OUD.

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[1]Drug Alcohol Depend. 2014;142:98-104. [2]Pain Med. 2011;12(4):657-667. [3]Braeburn Pharmaceuticals. Nov 14, 2017.