

## **Butrans<sup>®</sup> (buprenorphine) Transdermal System (BTDS) improves sleep quality and reduces sleep problems in patients with moderate-to-severe chronic low back pain**

Aaron Yarlus<sup>1</sup>, Warren Wen<sup>2</sup>, Maribeth Kowalski<sup>2</sup>, Shau Yu Lynch<sup>2</sup>, Bradley Dain<sup>2</sup>, Steven Ripa<sup>2</sup>

<sup>1</sup>QualityMetric, Inc., Lincoln, RI, USA, <sup>2</sup>Purdue Pharma LP, Stamford, CT, USA

### **Purpose**

To examine the initial burden of moderate to severe chronic low back pain (LBP) on patients' sleep quality, and to compare the impact of 12 weeks' treatment with BTDS, relative to a placebo, on improving sleep quality and reducing sleep problems in these patients.

### **Method**

Data were collected from a multicenter, double-blind (DB), placebo-controlled randomized trial evaluating BTDS 10 mcg/hour and 20 mcg/hour for treatment of moderate-to-severe chronic LBP in opioid-naïve patients. A run-in period that established tolerability and responsiveness to BTDS dosages was followed by a 12-week DB phase. Before and after the run-in period, and at 4 weeks, 8 weeks, and 12 weeks during the DB phase, patients completed the 12-item Medical Outcomes Study Sleep Scale (MOS-SS), which yields scores on several domains of sleep, including Disturbance, Adequacy, and Somnolence, and a Sleep Problems Index (SPI) for overall sleep quality. SF-36v2 scores at week 12 and over weeks 4, 8, and 12 were compared between BTDS 10/20 and placebo groups using ANCOVA and repeated measures analysis, respectively. Analyses were protocol-specified for Disturbance, while all other analyses were posthoc. Burden was examined by comparing trial patients with a U.S. general-population normative sample.

### **Results**

MOS-SS scores were collected from a total of 541 patients at the pre-run-in visit and from 498 patients at the week 12 DB visit (with 237 patients in BTDS arms and 261 patients in the placebo group at the latter visit). ANOVA analyses indicated no statistical differences among any SF-36v2 scales and summary scores at either pre-run-in or post-run-in visits (all  $P > .05$ ). ANCOVA analyses of week 12 MOS-SS scores across treatment groups showed significantly less sleep disturbance and better SPI scores for patients receiving BTDS than for patients receiving placebo ( $P < .05$ ). No differences were found for domains of sleep adequacy and somnolence. Repeated measures analysis of Sleep Disturbance and SPI scores using mixed linear models indicated that better scores for patients in the BTDS over placebo group emerged for both measures by week 4 of treatment, and this advantage was steadily maintained for SPI scores throughout the remainder of the 12-week DB phase. Results of the burden analysis indicated that at baseline, MOS-SS scores for the trial sample were significantly below those of an age- and gender- matched US representative sample for sleep disturbance and adequacy domains and the SPI summary (all  $P < .05$ ). By week 12, deficits relative to the matched norms were fully eliminated in BTDS patients for the sleep disturbance domain and SPI summary, while the placebo group continued to show a deficit in sleep disturbance relative to the normative sample.

### **Conclusions**

These results show that patients with moderate to severe chronic LBP who received BTDS exhibited significantly larger reductions in sleep disturbances and increases in overall sleep quality than patients receiving placebo treatment. Evaluation of changes over the course of the trial indicate that the improved sleep quality and reduced sleep problems associated with BTDS treatment emerged within 4 weeks of treatment, and were maintained throughout the

remaining 8 weeks of the DB phase. The burden of LBP observed for sleep disturbance and overall sleep quality was eliminated as a function of 12 weeks of BTDS treatment compared with placebo.