

Table 5. Total abstinence and sickness scores during the 24 hour substitution test.*

Drug	Abstinence Score	Sickness Score
Placebo	189.6 $\pm$ 24.9	10.6 $\pm$ 2.2
Morphine 3 mg	154.2 $\pm$ 24.4	10.0 $\pm$ 0.8
Morphine 6 mg	130.2 $\pm$ 20.0 [†]	4.6 $\pm$ 2.0 [†]
Azidomorphine 1.8 mg	106.4 $\pm$ 15.4 [‡]	1.8 $\pm$ 1.1 [‡]

*Total scores represent the means and standard errors for 11 observations in 5 subjects in which placebo, morphine and azidomorphine were substituted for 3 consecutive 15 mg doses of morphine.

†Significantly different from placebo as calculated using 2-way analysis of the variance and the method of least significant differences.

These present studies indicate that azidomorphine has morphine-like activity in man as indicated by its ability to produce morphine-like subjective effects, miosis and to suppress morphine abstinence. Azidomorphine is 10 to 50 times more potent than morphine and may have a somewhat more rapid onset and shorter duration of action.

Evaluation of Butorphanol for Morphine-like Effects

The morphinan derivative, butorphanol, (α -BC-2627) (Fig. 7) is a morphine antagonist having analgesic activity in man and animals.²⁰ Butorphanol does not substitute for morphine nor suppress abstinence in the morphine-dependent monkey.²⁰ Butorphanol is currently being evaluated for the ability to produce dependence of the morphine type in man.