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Avinza®
(Morphine Sulfate Extended-Release Capsules)

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Drug name: Avinza® is the brand name for a morphine sulfate extended-release capsule, formerly called Morphelan™ (Ligand Pharmaceuticals, San Diego, CA).

Classification: Opioid analgesic

Action: Avinza binds to opioid receptors in the central nervous system (CNS), causing inhibition of ascending pain pathways and altering the perception of and response to pain. The drug also produces generalized CNS depression. Morphine, a pure opioid agonist, is the active ingredient in Avinza. Morphine is relatively selective for the mu receptor, although it can interact with the other opioid receptors (kappa and gamma) at higher doses.

Indication: Avinza capsules are a modified-release formulation of morphine sulfate indicated for once-daily administration for relief of moderate to severe pain for patients requiring continuous, around-the-clock opioid therapy for an extended period of time.

Capsule formulation description: Avinza is comprised of two components: immediate release and extended release. The extended-release component of Avinza uses the proprietary Spheroidal Oral Drug Absorption System (SODAS™) technology. When Avinza is ingested, approximately 10% of the morphine is available immediately for absorption and the remaining 90% is released continuously during a 24-hour period. Figure 1 shows a schematic representation of a SODAS bead.

Each bead within the capsule is approximately 1–2 mm in diameter. Gastrointestinal (GI) fluid is drawn osmotically into the core of these SODAS beads, allowing morphine to dissolve out of the beads. As fluid is drawn into the beads, permeable pores develop that regulate the rate of morphine efflux. Thus, the rate of diffusion is driven by morphine's concentration gradient and regulated by pore diameter. The end result is a continuous efflux of morphine through rate-controlled pores over a 24-hour period.

Metabolism: Once the morphine in Avinza is absorbed, it is metabolized identically to other morphine formulations. Morphine is hepatically metabolized via conjugation with glucuronic acid into an active metabolite, morphine-6-glucuronide (M6G), and an inactive metabolite, morphine-3-glucuronide (M3G). Minor metabolites include morphine-3-6-diglucuronide (inactive), normorphine (active), and 3-ethereal sulfate (inactive).

Half-life: The half-life of Avinza is 24 hours. The half-life of morphine is two to four hours, although with Avinza, the rate-limiting step of elimination is absorption. The drug is absorbed continuously into the body for 24 hours. Thus, the half-life of morphine is not an adequate predictor of the rate of elimination.

Steady-state plasma concentrations of morphine are achieved two to three days after initiation of once-daily administration of Avinza.

Excretion: Renal (primarily as M3G; approximately 10% is excreted unchanged).

Effects and adverse reactions: The effects and side effects of morphine can be broken down into five categories: CNS, respiratory, GI, cardiovascular, and miscellaneous. (*Note.* The numbers in parentheses that follow are average percentages of patients who reported the particular side effect in question in clinical trials of Avinza.)

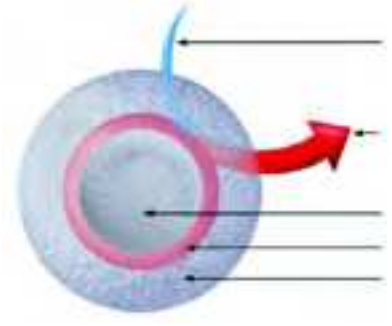

FIGURE 1. SPHEROIDAL ORAL DRUG ABSORPTION SYSTEM (SODAS™) TECHNOLOGY ILLUSTRATION

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At the time this article was written, Cynthia R. King, PhD, NP, RN, FAAN, was an associate director for Ligand Pharmaceuticals in San Diego, CA. Ligand Pharmaceuticals is the manufacturer of Avinza®, the drug described in this article. Ashkan Khabazian, PharmD, is a pharmacy practice resident for Scripps Mercy Hospital in San Diego, CA. (Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Clinical Journal of Oncology Nursing *or the Oncology Nursing Society.)*

Key Words: analgesics, opioid; morphine derivatives

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