What is ketamine?
KetAMINE is an N-methyl-D-aspartate (NMDA) antagonist that can inhibit induction and maintenance of central sensitization (“wind-up”) after painful stimuli. Ketamine has traditionally been used only as dissociative anesthetic for moderate sedation and as part of general anesthesia for surgical procedures. More recently, a number of studies have detailed the success of ketamine in lower (sub-anesthetic) doses as an analgesic given either IV, or in some cases orally.

How does ketamine help with pain control?
The presence of ionotropic glutamate receptors, such as NMDA receptors on peripheral sensory axons could be the basis of peripheral ketamine-induced analgesia. There is a substantial amount of evidence that glutamate via NMDA receptors play a pivotal role in the development and maintenance of central hyperactive pain states such as hyperalgesia, allodynia, and spontaneous pain. Ketamine blocks the NMDA receptor and has been shown to produce analgesia and prevent the development of tolerance.

Why combine ketamine with an opioid for IV PCA?
Addition of ketamine to morphine for IV PCA has been shown to result in improved pain control along with an opioid sparing effect.

How is IV PCA KetAMINE/Opioid administered?
→ Currently, only the Anesthesiology Acute Pain Service (APS) can order IV PCA ketAMINE with either morphine or hydromorphone.
→ The recommended dose is 1mg ketAMINE/1mg MORPHine in 1mL [or 1mg ketaAMINE/200mcg HYDROmorphine] with a lockout of every 6-10 minutes.
→ Pharmacists should enter orders for these PCA syringes in the same manner as concentrated PCA syringes are ordered in Centricity (IV system as KETMORPCA+). KetAMINE/opioid syringes will be stored separately in narcotic drip drawer in AcuDose cabinets (you need to override to access and then end up with narc gtt order in AdminRx).
→ Nurses should assess patients using the same time frame and parameters as they do for traditional IV PCA. Patients should be assessed for pain relief, sedation, and side effects every 2 hours for the first 8 hours and then every 4 hours during the course of therapy.

The most common concerns about ketAMINE as an analgesic relate to its mind-altering effects (dysphoria, dissociative feelings, alertness disturbances and sensory changes such as dizziness, anxiety, confusion, vivid dreams, and delirium). Effects are dose related and in the setting of postoperative PCA, most trials did not find a difference in adverse psychotomimetic effects. There have been no reported serious events in reported ketAMINE doses used for IV PCA. However, in larger doses or overdose there have been reports of reduced cardiac and pulmonary performance in severely ill patients and of arrhythmias.
References