PDR®

53

EDITION

1999

PHYSICIANS' DESK REFERENCE®

Medical Consultant

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trolled by administration
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priate antiemetics. A sin-
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from the gastrointestinal
nhance clearance of theo-
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i patients with intractable
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to insure that the concen-

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ncg/mL in patients <60 years

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ncreasing the rate of theophyl-
reral methods may rapidly de-
, but the risks of the procedure
potential benefit. Charcoal he-
ctive method of extracorporeal
rlline clearance up to six fold.
ncluding hypotension, hypoxia,
and bleeding diatheses may oc-
s efficient as multiple-dose oral
lower risk of serious complica-
fusion. Hemodialysis should be
when charcoal hemoperfusion
dose oral charcoal is ineffective
is. Serum theophylline concen-
ncg/mL after discontinuation of
nemodialysis due to redistribu-
ue tissue compartment. Persis-

...is is ineffective for theophylline removal; ex-
...nsfusions in neonates have been minimally effec-

...AND ADMINISTRATION

...400 or 600 mg Tablets can be taken once a day in
...ng or evening. It is recommended that Uniphyl be
...h meals. Patients should be advised that if they
...take Uniphyl® with food it should be taken con-
...with food and if they take it in a fasted condition it
...ntinely be taken fasted. It is important that the
...henever dosed be dosed consistently with or with-

...Tablets are not to be chewed or crushed. The
...blet may be split. Infrequently, patients receiving
...400 or 600 mg Tablets may pass an intact matrix
...in the stool or via colostomy. These matrix tablets
...ontain little or no residual theophylline.
...ated patients, 12 years of age or older, who are taking
...diate-release or controlled-release theophylline
...may be transferred to once-daily administration of
...or 600 mg Uniphyl® Tablets on a mg-for-mg basis.
...be recognized that the peak and trough serum the-
...levels produced by the once-daily dosing may vary
...dose produced by the previous product and/or regi-

...Considerations: The steady-state peak serum the-
...concentration is a function of the dose, the dosing
...and the rate of theophylline absorption and clear-
...in the individual patient. Because of marked individ-
...ences in the rate of theophylline clearance, the
...required to achieve a peak serum theophylline concen-
...in the 10–20 mcg/mL range varies fourfold among
...similar patients in the absence of factors known
...theophylline clearance (e.g., 400–1600 mg/day in
...<60 years old and 10–36 mg/kg/day in children 1–9
...old). For a given population there is no single theo-
...dose that will provide both safe and effective serum
...trations for all patients. Administration of the me-
...theophylline dose required to achieve a therapeutic
...theophylline concentration in a given population may
...in either sub-therapeutic or potentially toxic serum
...ophylline concentrations in individual patients. For ex-
...at a dose of 900 mg/d in adults <60 years or 22 mg/
...children 1–9 years, the steady-state peak serum the-
...line concentration will be <10 mcg/mL in about 30% of
...10–20 mcg/mL in about 50% and 20–30 mcg/mL in
...20% of patients. **The dose of theophylline must be**
...ualized on the basis of peak serum theophylline con-
...ion measurements in order to achieve a dose that
...ovide maximum potential benefit with minimal risk
...erse effects.
...caffeine-like adverse effects and excessive serum
...trations in slow metabolizers can be avoided in most
...by starting with a sufficiently low dose and slowly
...the dose, if judged to be clinically indicated, in
...ements (See Table V). Dose increases should only
...if the previous dosage is well tolerated and at in-
...of no less than 3 days to allow serum theophylline
...trations to reach the new steady-state. Dosage ad-
...should be guided by serum theophylline concen-
...measurement (see PRECAUTIONS, Laboratory
... and DOSAGE AND ADMINISTRATION, Table VI).
...care providers should instruct patients and care giv-
...discontinue any dosage that causes adverse effects, to
...hold the medication until these symptoms are gone and
...resume therapy at a lower, previously tolerated dos-
...(see WARNINGS).
...patient's symptoms are well controlled, there are no
...adverse effects, and no intervening factors that
...other dosage requirements (see WARNINGS and
...CAUTIONS), serum theophylline concentrations
...be monitored at 6 month intervals for rapidly grow-
...children and at yearly intervals for all others. In acutely
...ill patients, serum theophylline concentrations should be
...measured at frequent intervals, e.g., every 24 hours.
...theophylline distributes poorly into body fat, therefore,
...dose should be calculated on the basis of ideal body

...contains theophylline dosing titration schema rec-
...ded for patients in various age groups and clinical
...ances. Table VI contains recommendations for the-
...dosage adjustment based upon serum theophyl-
...trations. **Application of these general dosing**
...dations to individual patients must take into ac-
...unique clinical characteristics of each patient. In
...ose recommendations should serve as the upper
...dosage adjustments in order to decrease the risk
...) serious adverse events associated with un-
...ge increases in serum theophylline concentra-

Table V. Dosing initiation and titration (as anhydrous theophylline).*

A. Children (12–15 years) and adults (16–60 years) without risk factors for impaired clearance.

Titration Step	*Children < 45 kg*	*Children > 45 kg and adults*
1. Starting Dosage	12–14 mg/kg/day up to a maximum of 300 mg/day admin. QD*	300–400 mg/day† admin. QD*
2. After 3 days, if tolerated, increase dose to:	16 mg/kg/day up to a maximum of 400 mg/day admin. QD*	400–600 mg/day† admin. QD*
3. After 3 more days, if tolerated and if needed increase dose to:	20 mg/kg/day up to a maximum of 600 mg/day admin. QD*	As with all theophylline products, doses greater than 600 mg should be titrated according to blood level (See Table VI)

†If caffeine-like adverse effects occur, then consideration should be given to a lower dose and titrating the dose more slowly (see ADVERSE REACTIONS).

B. Patients With Risk Factors For Impaired Clearance, The Elderly (>60 Years), And Those In Whom It Is Not Feasible To Monitor Serum Theophylline Concentrations:
In children 12–15 years of age, the theophylline dose should not exceed 16 mg/kg/day up to a maximum of 400 mg/day in the presence of risk factors for reduced theophylline clearance (see WARNINGS) or if it is not feasible to monitor serum theophylline concentrations.
In adolescents ≥16 years and adults, including the elderly, the theophylline dose should not exceed 400 mg/day in the presence of risk factors for reduced theophylline clearance (see WARNINGS) or if it is not feasible to monitor serum theophylline concentrations.
*Patients with more rapid metabolism clinically identified by higher than average dose requirements, should receive a smaller dose more frequently (every 12 hours) to prevent breakthrough symptoms resulting from low trough concentrations before the next dose.

Table VI. Dosage adjustment guided by serum theophylline concentration.

Peak Serum Concentration	Dosage Adjustment
<9.9 mcg/mL	If symptoms are not controlled and current dosage is tolerated, increase dose about 25%. Recheck serum concentration after three days for further dosage adjustment.
10–14.9 mcg/mL	If symptoms are controlled and current dosage is tolerated, maintain dose and recheck serum concentration at 6–12 month intervals.¶ If symptoms are not controlled and current dosage is tolerated consider adding additional medication(s) to treatment regimen.
15–19.9 mcg/mL	Consider 10% decrease in dose to provide greater margin of safety even if current dosage is tolerated.¶
20–24.9 mcg/mL	Decrease dose by 25% even if no adverse effects are present. Recheck serum concentration after 3 days to guide further dosage adjustment.
25–30 mcg/mL	Skip next dose and decrease subsequent doses at least 25% even if no adverse effects are present. Recheck serum concentration after 3 days to guide further dosage adjustment. If symptomatic, consider whether overdose treatment is indicated (see recommendations for chronic overdosage).
>30 mcg/mL	Treat overdose as indicated (see recommendations for chronic overdosage). If theophylline is subsequently resumed, decrease dose by at least 50% and recheck serum concentration after 3 days to guide further dosage adjustment.

¶ Dose reduction and/or serum theophylline concentration measurement is indicated whenever adverse effects are present, physiologic abnormalities that can reduce theophylline clearance occur (e.g., sustained fever), or a drug that interacts with theophylline is added or discontinued (see WARNINGS).

HOW SUPPLIED

Uniphyl® (theophylline, anhydrous) 400 mg Controlled-Release Tablets are supplied in white-opaque plastic bottles containing 100 tablets (NDC 0034-7004-80) or 500 tablets (NDC 0034-7004-70).
Each round, white, scored 400 mg tablet bears the symbol PF on one side and is marked U400 on the other side.
Uniphyl® (theophylline, anhydrous) 600 mg Controlled-Release Tablets are supplied in white-opaque plastic bottles containing 100 tablets (NDC 0034-7006-80).
Each rectangular, concave, white 600 mg scored tablet bears the symbol PF on one side and is marked U600 on the other side.
Store at controlled room temperature 15°–30°C (59°–86°F).
Dispense in tight, light-resistant container.
CAUTION: Federal law prohibits dispensing without prescription.

The Purdue Frederick Company
Norwalk, CT 06850-3590

U.S. Patent Numbers 4,235,870 and 4,366,310
June 12, 1996 R1374
Shown in Product Identification Guide, page 333

EDUCATIONAL MATERIAL

Laxative Protocol Sheets (PS77) 1 page (pad of 25)
Available to physicians, nurses and pharmacists

Purdue Pharma L.P.
100 CONNECTICUT AVENUE
NORWALK, CT 06850-3590

DHCplus® Capsules

MS Contin® Tablets—see listing under The Purdue Frederick Company, page 2556

MSIR® Capsules—see listing under The Purdue Frederick Company, page 2559

MSIR® Tablets—see listing under The Purdue Frederick Company, page 2559

MSIR® Liquid—see listing under The Purdue Frederick Company, page 2559

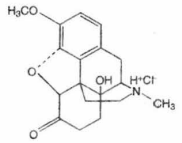
OXYCONTIN® Ⓒ Ⓡ
(OXYCODONE HCL CONTROLLED-RELEASE) TABLETS

Warning-May be habit forming.
10mg 20mg 40mg 80mg*

***80 mg For use in opioid tolerant patients only.**

DESCRIPTION

OxyContin® (oxycodone hydrochloride controlled-release) tablets are an opioid analgesic supplied in 10 mg, 20 mg, 40 mg, and 80 mg tablet strengths for oral administration. The tablet strengths describe the amount of oxycodone per tablet as the hydrochloride salt. The structural formula for oxycodone hydrochloride is as follows:



$C_{18}H_{21}NO_4 \cdot HCl$ MW 351.83

The chemical formula is 4, 5-epoxy-14-hydroxy-3-methoxy-17-methylmorphinan-6-one hydrochloride.
Oxycodone is a white, odorless crystalline powder derived from the opium alkaloid, thebaine. Oxycodone hydrochloride dissolves in water (1 g in 6 to 7 mL). It is slightly soluble in alcohol (octanol water partition coefficient 0.7). The tablets contain the following inactive ingredients: ammonio

Continued on next page

OxyContin—Cont.

methacrylate copolymer, hydroxypropyl methylcellulose, lactose, magnesium stearate, povidone, red iron oxide (20 mg strength tablet only), stearyl alcohol, talc, titanium dioxide, triacetin, yellow iron oxide (40 mg strength tablet only), yellow iron oxide with FD&C blue No. 2 (80 mg strength tablet only), and other ingredients.

OxyContin® 80 mg Tablets ARE FOR USE IN OPIOID TOLERANT PATIENTS ONLY.

CLINICAL PHARMACOLOGY

Central Nervous System

Oxycodone is a pure agonist opioid whose principal therapeutic action is analgesia. Other therapeutic effects of oxycodone include anxiolysis, euphoria and feelings of relaxation. Like all pure opioid agonists, there is no ceiling effect to analgesia, such as is seen with partial agonists or non-opioid analgesics.

The precise mechanism of the analgesic action is unknown. However, specific CNS opioid receptors for endogenous compounds with opioid-like activity have been identified throughout the brain and spinal cord and play a role in the analgesic effects of this drug.

Oxycodone produces respiratory depression by direct action on brain stem respiratory centers. The respiratory depression involves both a reduction in the responsiveness of the brain stem respiratory centers to increases in carbon dioxide tension and to electrical stimulation.

Oxycodone depresses the cough reflex by direct effect on the cough center in the medulla. Antitussive effects may occur with doses lower than those usually required for analgesia.

Oxycodone causes miosis, even in total darkness. Pinpoint pupils are a sign of opioid overdose but are not pathognomonic. Marked mydriasis rather than miosis may be seen due to hypoxia in overdose situations.

Gastrointestinal Tract and Other Smooth Muscle

Oxycodone causes a reduction in motility associated with an increase in smooth muscle tone in the antrum of the stomach and duodenum. Digestion of food in the small intestine is delayed and propulsive contractions are decreased. Propulsive peristaltic waves in the colon are decreased, while tone may be increased to the point of spasm resulting in constipation. Other opioid-induced effects may include a reduction in gastric, biliary and pancreatic secretions, spasm of sphincter of Oddi, and transient elevations in serum amylase.

Cardiovascular System

Oxycodone may produce release of histamine with or without associated peripheral vasodilation. Manifestations of histamine release and/or peripheral vasodilation may include pruritus, flushing, red eyes, sweating, and/or orthostatic hypotension.

Concentration—Efficacy Relationships (Pharmacodynamics)

Studies in normal volunteers and patients reveal predictable relationships between oxycodone dosage and plasma oxycodone concentrations, as well as between concentration and certain expected opioid effects. In normal volunteers these include pupillary constriction, sedation and overall "drug effect" and in patients, analgesia and feelings of "relaxation." In non-tolerant patients, analgesia is not usually seen at a plasma oxycodone concentration of less than 5–10 ng/mL.

As with all opioids, the minimum effective plasma concentration for analgesia will vary widely among patients, especially among patients who have been previously treated with potent agonist opioids. As a result, patients need to be treated with individualized titration of dosage to the desired effect. The minimum effective analgesic concentration of oxycodone for any individual patient may increase with repeated dosing due to an increase in pain and/or the development of tolerance.

Concentration—Adverse Experience Relationships

OxyContin tablets are associated with typical opioid-related adverse experiences similar to those seen with immediate-release oxycodone and all opioids. There is a general relationship between increasing oxycodone plasma concentration and increasing frequency of dose-related opioid adverse experiences such as nausea, vomiting, CNS effects and respiratory depression. In opioid-tolerant patients, the situation is altered by the development of tolerance to opioid-related side effects, and the relationship is poorly understood.

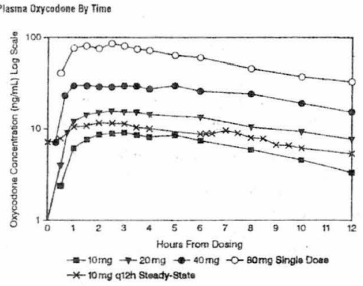
As with all opioids, the dose must be individualized (see DOSAGE AND ADMINISTRATION), because the effective analgesic dose for some patients will be too high to be tolerated by other patients.

PHARMACOKINETICS AND METABOLISM

The activity of OxyContin® (oxycodone hydrochloride controlled-release) tablets is primarily due to the parent drug oxycodone. OxyContin tablets are designed to provide controlled delivery of oxycodone over 12 hours. Oxycodone is well absorbed from OxyContin tablets with an oral bioavailability of from 60% to 87%. The relative oral bioavailability of OxyContin to immediate-release oral dosage forms is 100%. Upon repeated dosing in normal volunteers, steady-state levels were achieved within 24–36 hours. Dose proportionality has been established for the 10 mg, 20 mg, 40 mg, and 80 mg tablet strengths for both peak plasma levels (C_{max}) and extent of absorption (AUC). Oxycodone is extensively metabolized and eliminated primarily in the urine as both conjugated and unconjugated metabolites. The apparent elimination half-life of oxycodone following the administration of OxyContin was 4.5 hours compared to 3.2 hours for immediate-release oxycodone.

Absorption

About 60% to 87% of an oral dose of oxycodone reaches the central compartment in comparison to a parenteral dose. This high oral bioavailability is due to low pre-systemic and/or first-pass metabolism. In normal volunteers the $t^1/_2$ of absorption is 0.4 hours for immediate-release oral oxycodone. In contrast, OxyContin tablets exhibit a biphasic absorption pattern with two apparent absorption half-times of 0.6 and 6.9 hours, which describes the initial release of oxycodone from the tablet followed by a prolonged release.



Dose proportionality has been established for the 10 mg, 20 mg, 40 mg, and 80 mg tablet strengths for both peak plasma concentrations (C_{max}) and extent of absorption (AUC) (see Table 1 below). Given the short half-life of elimination of oxycodone from OxyContin, steady-state plasma concentrations of oxycodone are achieved within 24–36 hours of initiation of dosing with OxyContin tablets. In a study comparing 10 mg of OxyContin every 12 hours to 5 mg of immediate-release oxycodone every 6 hours the two treatments were found to be equivalent for AUC and C_{max}, and similar for C_{min} (trough) concentrations. There was less fluctuation in plasma concentrations for the OxyContin tablets than for the immediate-release formulation.

[See table 1 below]

Food Effects

In contrast to immediate-release formulations, food has no significant effect on the absorption of oxycodone from OxyContin. Oxycodone release from OxyContin tablets is pH independent.

Distribution

Following intravenous administration, the volume of distribution (Vss) for oxycodone was 2.6L/kg. Oxycodone binding to plasma protein at 37°C and a pH of 7.4 was about 45%. Once absorbed, oxycodone is distributed to skeletal muscle, liver, intestinal tract, lungs, spleen and brain. Oxycodone has been found in breast milk (see PRECAUTIONS).

Metabolism

Oxycodone hydrochloride is extensively metabolized to noroxycodone, oxymorphone, and their glucuronides. The major circulating metabolite is noroxycodone with an AUC ratio of 0.6 relative to that of oxycodone. Noroxycodone is reported to be a considerably weaker analgesic than oxycodone. Oxymorphone, although possessing analgesic activity, is present in the plasma only in low concentrations. The correlation between oxymorphone concentrations and opioid effects was much less than that seen with oxycodone plasma concentrations. The analgesic activity profile of other metabolites is not known at present.

The formation of oxymorphone, but not noroxycodone, is mediated by CYP2D6 and as such its formation can, in theory, be affected by other drugs (see Drug-Drug Interactions).

Excretion

Oxycodone and its metabolites are excreted primarily via the kidney. The amounts measured in the urine have been reported as follows: free oxycodone up to 19%; conjugated oxycodone up to 50%; free oxymorphone 0%; conjugated oxymorphone ≤ 14%; both free and conjugated noroxycodone have been found in the urine but not quantified. The total plasma clearance was 0.8 L/min for adults.

Special Populations

Elderly

The plasma concentrations of oxycodone are only nominally affected by age, being 15% greater in elderly as compared to young subjects. There were no differences in adverse events reporting between young and elderly subjects.

Gender

Female subjects have, on average, plasma oxycodone concentrations up to 25% higher than males on a body weight adjusted basis. The reason for this difference is unknown.

Renal Impairment

Preliminary data from a study involving patients with mild to severe renal dysfunction (creatinine clearance <60 mL/min) show peak plasma oxycodone and noroxycodone concentrations 50% and 20% higher, respectively and AUC values for oxycodone, noroxycodone and oxymorphone 60%, 50% and 40% higher than normal subjects, respectively. This is accompanied by an increase in sedation but not by differences in respiratory rate, pupillary constriction, or several other measures of drug effect. There was an increase in $t^1/_2$ of elimination for oxycodone of only 1 hour (see PRECAUTIONS).

Hepatic Impairment

Preliminary data from a study involving patients with mild to moderate hepatic dysfunction show peak plasma oxycodone and noroxycodone concentrations 50% and 20% higher, respectively, than normal subjects. AUC values are 95% and 65% higher, respectively. Oxymorphone peak plasma concentrations and AUC values are lower by 30% and 40%. These differences are accompanied by increases in some, but not other, drug effects. The $t^1/_2$ elimination for oxycodone increased by 2.3 hours (see PRECAUTIONS).

Rectal Administration

Rectal administration of OxyContin tablets is not recommended. Preliminary data from a study involving 21 normal volunteers, show OxyContin tablets administered per rectum resulted in an AUC 39% greater and a C_{max} 9% higher than tablets administered by mouth (see PRECAUTIONS).

Drug-Drug Interactions (see PRECAUTIONS)

Oxycodone is metabolized in part via CYP2D6 to oxymorphone which represents less than 15% of the total administered dose. This route of elimination can be blocked by a variety of drugs (e.g., certain cardiovascular drugs and antidepressants). Patients receiving such drugs concomitantly with OxyContin do not appear to present different therapeutic profiles than other patients.

CLINICAL TRIALS

OxyContin® (oxycodone hydrochloride controlled-release) tablets were evaluated in studies involving 713 patients with either cancer or non-cancer pain. All patients receiving OxyContin were dosed q12h. Efficacy comparable to other forms of oral oxycodone was demonstrated in clinical studies using pharmacokinetic, pharmacodynamic and efficacy outcomes. The outcome of these trials indicated: (1) a positive relationship between dose and plasma oxycodone concentration, (2) a positive relationship between plasma oxy-

Table 1
Mean [% coefficient variation]

Regimen/Dosage Form	AUC (ng·hr/mL)†	C_{max} (ng/mL)	T_{max} (hrs)	Trough Conc. (ng/mL)
Single Dose				
10 mg OxyContin	100.7 [26.6]	10.6 [20.1]	2.7 [44.1]	n.a.
20 mg OxyContin	207.5 [35.9]	21.4 [36.6]	3.2 [57.9]	n.a.
40 mg OxyContin	423.1 [33.3]	39.3 [34.0]	3.1 [77.4]	n.a.
80 mg OxyContin*	1085.5 [32.3]	98.5 [32.1]	2.1 [52.3]	n.a.
Multiple Dose				
10 mg OxyContin Tablets q12h	103.6 [38.6]	15.1 [31.0]	3.2 [69.5]	7.2 [48.1]
5 mg immediate-release q6h	99.0 [36.2]	15.5 [28.8]	1.6 [49.7]	7.4 [50.9]

† for single-dose $AUC=AUC_{0\text{-}inf}$; for multiple-dose $AUC=AUC_{0\text{-}T}$
* data obtained while volunteers received naltexone which can enhance absorption.

codone concentration and analgesia, and (3) an observed peak to trough variation in plasma concentration with OxyContin lying within the observed range established with qid dosing of immediate-release oxycodone in clinical populations at the same total daily dose.

In clinical trials, OxyContin tablets were substituted for a wide variety of analgesics, including acetaminophen (APAP), aspirin (ASA), other non-steroidal anti-inflammatory drugs (NSAIDs), opioid combination products and single-entity opioids, primarily morphine. In cancer patients receiving adequate opioid therapy at baseline, pain intensity scores and acceptability of therapy remained unchanged by transfer to OxyContin. For non-cancer pain patients who had moderate to severe pain at baseline on prn opioid therapy, pain control and acceptability of therapy improved with the introduction of fixed-interval therapy with OxyContin.

Use in Cancer Pain

OxyContin was studied in three double-blind, controlled clinical trials involving 341 cancer patients and several open-label trials with therapy durations of over 10 months. Two, double-blind, controlled clinical studies indicated that OxyContin dosed q12h produced analgesic efficacy equivalent to immediate-release oxycodone dosed qid at the same total daily dose. Peak and trough plasma concentrations attained were similar to those attained with immediate-release oxycodone at equivalent total daily doses. With titration to analgesic effect and proper use of rescue medication, nearly every patient achieved adequate pain control with OxyContin.

In the third study, a double-blind, active-controlled, crossover trial, OxyContin dosed q12h was shown to be equivalent in efficacy and safety to immediate-release oxycodone dosed qid at the same total daily dose. Patients were able to be titrated to an acceptable analgesic effect with either OxyContin or immediate-release oxycodone with both treatments providing stable pain control within 2 days in most patients.

In patients with cancer pain, the total daily OxyContin doses tested ranged from 20 mg to 640 mg per day. The average total daily dose was approximately 105 mg per day.

Studies in Non-Cancer Pain

A double-blind, placebo-controlled, fixed-dose, parallel group study was conducted in 133 patients with moderate to severe osteoarthritis pain, who were judged as having inadequate pain control with prn opioids and maximal non-steroidal anti-inflammatory therapy. In this study, 20 mg OxyContin q12h significantly decreased pain and improved quality of life, mood and sleep, relative to placebo. Both dose-concentration and concentration-effect relationships were noted with a minimum effective plasma oxycodone concentration of approximately 5–10 ng/mL.

In a double-blind, active-controlled, crossover study involving 57 patients with low-back pain inadequately controlled with prn opioids and non-opioid therapy, OxyContin administered q12h provided analgesia equivalent to immediate-release oxycodone administered qid. Patients could be titrated to an acceptable analgesic effect with either OxyContin or immediate-release forms of oxycodone.

Single-Dose Comparison with Standard Therapy

A single-dose, double-blind, placebo-controlled, post-operative study of 182 patients was conducted utilizing graded doses of OxyContin (10, 20 and 30 mg). Twenty and 30 mg of OxyContin gave equivalent peak analgesic effect compared to two oxycodone 5 mg /acetaminophen 325 mg tablets and to 15 mg immediate-release oxycodone, while the 10 mg dose of OxyContin was intermediate between both the immediate-release and combination products and placebo. The onset of analgesic action with OxyContin occurred within 1 hour in most patients following oral administration.

OxyContin is not recommended pre-operatively (preemptive analgesia) or for the management of pain in the immediate post-operative period (the first 12 to 24 hours following surgery) because the safety or appropriateness of fixed-dose, long-acting opioids in this setting has not been established.

Other Clinical Trials

In open-label trials involving approximately 200 patients with cancer-related and non-cancer pain, dosed according to the package insert recommendations, appropriate analgesic effectiveness was noted without regard to age, gender, race, or disease state. There were no unusual drug interactions observed in patients receiving a wide range of medications common in these populations.

For opioid-naive patients, the average total daily dose of OxyContin was approximately 40 mg per day. There was no evidence of oxycodone and metabolite accumulation during 3 months of therapy. For cancer pain patients the average total daily dose was 105 mg (range 20 to 720 mg) per day. There was a significant decrease in acute opioid-related side effects, except for constipation, during the first several weeks of therapy. Development of significant tolerance to analgesia was uncommon.

A cohort of patients have been treated with OxyContin 80 mg tablets. There were no differences in the efficacy or safety profiles than seen with the other tablet strengths.

INDICATIONS AND USAGE

OxyContin® tablets are a controlled-release oral formulation of oxycodone hydrochloride indicated for the management of moderate to severe pain where use of an opioid analgesic is appropriate for more than a few days. (See: CLINICAL PHARMACOLOGY; CLINICAL TRIALS).

CONTRAINDICATIONS

OxyContin® is contraindicated in patients with known hypersensitivity to oxycodone, or in any situation where opioids are contraindicated. This includes patients with significant respiratory depression (in unmonitored settings or the absence of resuscitative equipment), and patients with acute or severe bronchial asthma or hypercarbia. OxyContin is contraindicated in any patient who has or is suspected of having paralytic ileus.

WARNINGS

OxyContin® (oxycodone hydrochloride controlled-release) TABLETS ARE TO BE SWALLOWED WHOLE, AND ARE NOT TO BE BROKEN, CHEWED OR CRUSHED. TAKING BROKEN, CHEWED OR CRUSHED OxyContin TABLETS COULD LEAD TO THE RAPID RELEASE AND ABSORPTION OF A POTENTIALLY TOXIC DOSE OF OXYCODONE.

Respiratory Depression

Respiratory depression is the chief hazard from all opioid agonist preparations. Respiratory depression occurs most frequently in elderly or debilitated patients, usually following large initial doses in non-tolerant patients, or when opioids are given in conjunction with other agents that depress respiration.

Oxycodone should be used with extreme caution in patients with significant chronic obstructive pulmonary disease or cor pulmonale, and in patients having a substantially decreased respiratory reserve, hypoxia, hypercapnia, or preexisting respiratory depression. In such patients, even usual therapeutic doses of oxycodone may decrease respiratory drive to the point of apnea. In these patients alternative non-opioid analgesics should be considered, and opioids should be employed only under careful medical supervision at the lowest effective dose.

Head Injury

The respiratory depressant effects of opioids include carbon dioxide retention and secondary elevation of cerebrospinal fluid pressure, and may be markedly exaggerated in the presence of head injury, intracranial lesions, or other sources of preexisting increased intracranial pressure. Oxycodone produces effects on pupillary response and consciousness which may obscure neurologic signs of further increases in intracranial pressure in patients with head injuries.

Hypotensive Effect

OxyContin®, like all opioid analgesics, may cause severe hypotension in an individual whose ability to maintain blood pressure has been compromised by a depleted blood volume, or after concurrent administration with drugs such as phenothiazines or other agents which compromise vasomotor tone. OxyContin may produce orthostatic hypotension in ambulatory patients. OxyContin, like all opioid analgesics, should be administered with caution to patients in circulatory shock, since vasodilation produced by the drug may further reduce cardiac output and blood pressure.

PRECAUTIONS

Special precautions regarding OxyContin® 80 mg Tablets

OxyContin® 80 mg Tablets are for use only in opioid tolerant patients requiring daily oxycodone equivalent dosages of 160 mg or more. Care should be taken in the prescription of this tablet strength. Patients should be instructed against use by individuals other than the patient for whom it was prescribed, as such inappropriate use may have severe medical consequences.

General

OxyContin® (oxycodone hydrochloride controlled-release) tablets are intended for use in patients who require oral pain therapy with an opioid agonist of more than a few days duration. As with any opioid analgesic, it is critical to adjust the dosing regimen individually for each patient (see DOSAGE AND ADMINISTRATION).

Selection of patients for treatment with OxyContin should be governed by the same principles that apply to the use of similar controlled-release opioid analgesics (see INDICATIONS AND USAGE). Opioid analgesics given on a fixed-dosage schedule have a narrow therapeutic index in certain patient populations, especially when combined with other drugs, and should be reserved for cases where the benefits of opioid analgesia outweigh the known risks of respiratory depression, altered mental state, and postural hypotension. Physicians should individualize treatment in every case, using non-opioid analgesics, prn opioids and/or combination products, and chronic opioid therapy with drugs such as OxyContin in a progressive plan of pain management such as outlined by the World Health Organization, the Agency for Health Care Policy and Research, and the American Pain Society.

Use of OxyContin is associated with increased potential risks and should be used only with caution in the following conditions: acute alcoholism; adrenocortical insufficiency (e.g., Addison's disease); CNS depression or coma; delirium tremens; debilitated patients; kyphoscoliosis associated with respiratory depression; myxedema or hypothyroidism; prostatic hypertrophy or urethral stricture; severe impairment of hepatic, pulmonary or renal function; and toxic psychosis.

The administration of oxycodone, like all opioid analgesics, may obscure the diagnosis or clinical course in patients with acute abdominal conditions. Oxycodone may aggravate convulsions in patients with convulsive disorders, and all opioids may induce or aggravate seizures in some clinical settings.

Interactions with other CNS Depressants

OxyContin, like all opioid analgesics, should be used with caution and started in a reduced dosage ($^1/_3$ to $^1/_2$ of the usual dosage) in patients who are concurrently receiving other central nervous system depressants including sedatives or hypnotics, general anesthetics, phenothiazines, other tranquilizers and alcohol. Interactive effects resulting in respiratory depression, hypotension, profound sedation or coma may result if these drugs are taken in combination with the usual doses of OxyContin.

Interactions with Mixed Agonist/Antagonist Opioid Analgesics

Agonist/antagonist analgesics (i.e., pentazocine, nalbuphine, butorphanol and buprenorphine) should be administered with caution to a patient who has received or is receiving a course of therapy with a pure opioid agonist analgesic such as oxycodone. In this situation, mixed agonist/antagonist analgesics may reduce the analgesic effect of oxycodone and/or may precipitate withdrawal symptoms in these patients.

Ambulatory Surgery

OxyContin is not recommended pre-operatively (preemptive analgesia) or for the management of pain in the immediate post-operative period (the first 12 to 24 hours following surgery) for patients not previously taking the drug, because its safety in this setting has not been established.

Patients who are already receiving OxyContin tablets as part of ongoing analgesic therapy may be safely continued on the drug if appropriate dosage adjustments are made considering the procedure, other drugs given and the temporary changes in physiology caused by the surgical intervention (see PRECAUTIONS: Drug-Drug Interactions, and DOSAGE AND ADMINISTRATION).

Post-Operative Use

Morphine and other opioids have been shown to decrease bowel motility. Ileus is a common post-operative complication, especially after intra-abdominal surgery with opioid analgesia. Caution should be taken to monitor for decreased bowel motility in post-operative patients receiving opioids. Standard supportive therapy should be implemented.

Use in Pancreatic/Biliary Tract Disease

Oxycodone may cause spasm of the sphincter of Oddi and should be used with caution in patients with biliary tract disease, including acute pancreatitis. Opioids like oxycodone may cause increases in the serum amylase level.

Tolerance and Physical Dependence

Tolerance is the need for increasing doses of opioids to maintain a defined effect such as analgesia (in the absence of disease progression or other external factors). Physical dependence is the occurrence of withdrawal symptoms after abrupt discontinuation of a drug or upon administration of an antagonist. Physical dependence and tolerance are not unusual during chronic opioid therapy.

Significant tolerance should not occur in most of the patients treated with the lowest doses of oxycodone. It should be expected, however, that a fraction of cancer patients will develop some degree of tolerance and require progressively higher dosages of OxyContin to maintain pain control during chronic treatment. Regardless of whether this occurs as a result of increased pain secondary to disease progression or pharmacological tolerance, dosages can usually be increased safely by adjusting the patient's dose to maintain an acceptable balance between pain relief and side effects. The dosage should be selected according to the patient's individual analgesic response and ability to tolerate side effects. Tolerance to the analgesic effect of opioids is usually paralleled by tolerance to side effects, except for constipation.

Physical dependence results in withdrawal symptoms in patients who abruptly discontinue the drug or may be precipitated through the administration of drugs with opioid antagonist activity (see OVERDOSAGE). If OxyContin is abruptly discontinued in a physically dependent patient, an abstinence syndrome may occur. This is characterized by some or all of the following: restlessness, lacrimation, rhinorrhea, yawning, perspiration, chills, myalgia and mydriasis. Other symptoms also may develop, including: irritability, anxiety, backache, joint pain, weakness, abdominal cramps, insomnia, nausea, anorexia, vomiting, diarrhea, or increased blood pressure, respiratory rate or heart rate.

If signs and symptoms of withdrawal occur, patients should be treated by reinstitution of opioid therapy followed by a

Continued on next page

OxyContin—Cont.

gradual, tapered dose reduction of OxyContin combined with symptomatic support (see DOSAGE AND ADMINISTRATION: Cessation of Therapy).

Information for Patients/Caregivers

If clinically advisable, patients receiving OxyContin (oxycodone hydrochloride controlled-release) tablets or their caregivers should be given the following information by the physician, nurse, pharmacist or caregiver:

1. Patients should be advised that OxyContin tablets were designed to work properly only if swallowed whole. They may release all their contents at once if broken, chewed or crushed, resulting in a risk of overdose.
2. Patients should be advised to report episodes of breakthrough pain and adverse experiences occurring during therapy. Individualization of dosage is essential to make optimal use of this medication.
3. Patients should be advised not to adjust the dose of OxyContin without consulting the prescribing professional.
4. Patients should be advised that OxyContin may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery).
5. Patients should not combine OxyContin with alcohol or other central nervous system depressants (sleep aids, tranquilizers) except by the orders of the prescribing physician, because additive effects may occur.
6. Women of childbearing potential who become, or are planning to become, pregnant should be advised to consult their physician regarding the effects of analgesics and other drug use during pregnancy on themselves and their unborn child.
7. Patients should be advised that OxyContin is a potential drug of abuse. They should protect it from theft, and it should never be given to anyone other than the individual for whom it was prescribed.
8. Patients should be advised that they may pass empty matrix "ghosts" (tablets) via colostomy or in the stool, and that this is of no concern since the active medication has already been absorbed.
9. Patients should be advised that if they have been receiving treatment with OxyContin for more than a few weeks and cessation of therapy is indicated, it may be appropriate to taper the OxyContin dose, rather than abruptly discontinue it, due to the risk of precipitating withdrawal symptoms. Their physician can provide a dose schedule to accomplish a gradual discontinuation of the medication.

Laboratory Monitoring

Due to the broad range of plasma concentrations seen in clinical populations, the varying degrees of pain, and the development of tolerance, plasma oxycodone measurements are usually not helpful in clinical management. Plasma concentrations of the active drug substance may be of value in selected, unusual or complex cases.

Interactions with Alcohol and Drugs of Abuse

Oxycodone may be expected to have additive effects when used in conjunction with alcohol, other opioids or illicit drugs which cause central nervous system depression.

Use in Drug and Alcohol Addiction

OxyContin is an opioid with no approved use in the management of addictive disorders. Its proper usage in individuals with drug or alcohol dependence, either active or in remission, is for the management of pain requiring opioid analgesia.

Drug-Drug Interactions

Opioid analgesics, including OxyContin, may enhance the neuromuscular blocking action of skeletal muscle relaxants and produce an increased degree of respiratory depression.

Oxycodone is metabolized in part to oxymorphone via CYP2D6. While this pathway may be blocked by a variety of drugs (e.g., certain cardiovascular drugs and antidepressants), such blockade has not yet been shown to be of clinical significance with this agent. Clinicians should be aware of this possible interaction, however.

Use with CNS Depressants

OxyContin, like all opioid analgesics, should be started at $^1/_3$ to $^1/_2$ of the usual dosage in patients who are concurrently receiving other central nervous system depressants including sedatives or hypnotics, general anesthetics, phenothiazines, centrally acting anti-emetics, tranquilizers and alcohol because respiratory depression, hypotension and profound sedation or coma may result. No specific interaction between oxycodone and monoamine oxidase inhibitors has been observed, but caution in the use of any opioid in patients taking this class of drugs is appropriate.

Mutagenicity/Carcinogenicity

Oxycodone was not mutagenic in the following assays: Ames Salmonella and E. Coli test with and without metabolic activation at doses of up to 5000 µg, chromosomal aberration test in human lymphocytes (in the absence of metabolic activation and with activation after 48 hours of exposure) at doses of up to 1500 µg/ml, and in the in vivo bone marrow micronucleus assay in mice (at plasma levels of up to 48 µg/ml). Mutagenic results occurred in the presence of metabolic activation in the human chromosomal aberration test (at greater than or equal to 1250 µg/ml) at 24 but not 48 hours of exposure and in the mouse lymphoma assay at doses of 50 µg/ml or greater with metabolic activation and at 400 µg/ml or greater without metabolic activation. The data from these tests indicate that the genotoxic risk to humans may be considered low.

Studies of oxycodone in animals to evaluate its carcinogenic potential have not been conducted owing to the length of clinical experience with the drug substance.

Pregnancy

Teratogenic Effects—Category B: Reproduction studies have been performed in rats and rabbits by oral administration at doses up to 8 mg/kg (48 mg/m^2) and 125 mg/kg (1375 mg/m^2), respectively. These doses are 4 and 60 times a human dose of 120 mg/day (74 mg/m^2), based on mg/kg of a 60 kg adult (0.7 and 19 times this human dose based upon mg/m^2). The results did not reveal evidence of harm to the fetus due to oxycodone. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nonteratogenic Effects—Neonates whose mothers have been taking oxycodone chronically may exhibit respiratory depression and/or withdrawal symptoms, either at birth and/or in the nursery.

Labor and Delivery

OxyContin is not recommended for use in women during and immediately prior to labor and delivery because oral opioids may cause respiratory depression in the newborn.

Nursing Mothers

Low concentrations of oxycodone have been detected in breast milk. Withdrawal symptoms can occur in breast-feeding infants when maternal administration of an opioid analgesic is stopped. Ordinarily, nursing should not be undertaken while a patient is receiving OxyContin since oxycodone may be excreted in the milk.

Pediatric Use

Safety and effectiveness in pediatric patients below the age of 18 have not been established with this dosage form of oxycodone. However, oxycodone has been used extensively in the pediatric population in other dosage forms, as have the excipients used in this formulation. No specific increased risk is expected from the use of this form of oxycodone in pediatric patients old enough to safely take tablets if dosing is adjusted for the patient's weight (see DOSAGE AND ADMINISTRATION). **It must be remembered that OxyContin tablets cannot be crushed or divided for administration.**

Geriatric Use

In controlled pharmacokinetic studies in elderly subjects (greater than 65 years) the clearance of oxycodone appeared to be slightly reduced. Compared to young adults, the plasma concentrations of oxycodone were increased approximately 15%. In clinical trials with appropriate initiation of therapy and dose titration, no untoward or unexpected side effects were seen based on age, and the usual doses and dosing intervals are appropriate for the geriatric patient. As with all opioids, the starting dose should be reduced to $^1/_3$ to $^1/_2$ of the usual dosage in debilitated, non-tolerant patients.

Hepatic Impairment

A study of OxyContin in patients with hepatic impairment indicates greater plasma concentrations than those with normal function. The initiation of therapy at $^1/_3$ to $^1/_2$ the usual doses and careful dose titration is warranted.

Renal Impairment

In patients with renal impairment, as evidenced by decreased creatinine clearance (<60 mL/min.), the concentrations of oxycodone in the plasma are approximately 50% higher than in subjects with normal renal function. Dose initiation should follow a conservative approach. Dosages should be adjusted according to the clinical situation.

Gender Differences

In pharmacokinetic studies, opioid-naive females demonstrate up to 25% higher average plasma concentrations and greater frequency of typical opioid adverse events than males, even after adjustment for body weight. The clinical relevance of a difference of this magnitude is low for a drug intended for chronic usage at individualized dosages, and there was no male/female difference detected for efficacy or adverse events in clinical trials.

Rectal Administration

OxyContin® Tablets are not recommended for administration per rectum. A study in normal volunteers showed a significantly greater AUC and higher C_{max} during this route of administration (see PHARMACOKINETICS AND METABOLISM).

ADVERSE REACTIONS

Serious adverse reactions which may be associated with OxyContin® (oxycodone hydrochloride controlled-release) tablet therapy in clinical use are those observed with other opioid analgesics, including: respiratory depression, apnea, respiratory arrest, and (to an even lesser degree) circulatory depression, hypotension or shock (see OVERDOSE).

The non-serious adverse events seen on initiation of therapy with OxyContin are typical opioid side effects. These events are dose-dependent, and their frequency depends upon the dose, the clinical setting, the patient's level of opioid tolerance, and host factors specific to the individual. They should be expected and managed as a part of opioid analgesia. The most frequent (>5%) include constipation, nausea, somnolence, dizziness, vomiting, pruritus, headache, dry mouth, sweating and asthenia.

In many cases the frequency of these events during initiation of therapy may be minimized by careful individualization of starting dosage, slow titration, and the avoidance of large swings in the plasma concentrations of the opioid. Many of these adverse events will cease or decrease in intensity as OxyContin therapy is continued and some degree of tolerance is developed.

In clinical trials comparing OxyContin with immediate-release oxycodone and placebo, the most common adverse events (>5%) reported by patients (pts) at least once during therapy were:

Table 2

	OxyContin (n=227) #Pts (%)		Immediate-Release (n=225) #Pts (%)		Placebo (n=45) #Pts (%)	
Constipation	52	(23)	58	(26)	3	(7
Nausea	52	(23)	60	(27)	5	(11
Somnolence	52	(23)	55	(24)	2	(4
Dizziness	29	(13)	35	(16)	4	(9
Pruritus	29	(13)	28	(12)	1	(2
Vomiting	27	(12)	31	(14)	3	(7
Headache	17	(7)	19	(8)	3	(7
Dry Mouth	13	(6)	15	(7)	1	(2
Asthenia	13	(6)	16	(7)	—	—
Sweating	12	(5)	13	(6)	1	(2

The following adverse experiences were reported in OxyContin treated patients with an incidence between 1 and 5%. In descending order of frequency they were anorexia, nervousness, insomnia, fever, confusion, diarrhea, abdominal pain, dyspepsia, rash, anxiety, euphoria, dyspnea, postural hypotension, chills, twitching, gastritis, abnormal dreams, thought abnormalities, and hiccups.

The following adverse reactions occurred in less than 1% of patients involved in clinical trials:

General: accidental injury, chest pain, facial edema, malaise, neck pain, pain

Cardiovascular: migraine, syncope, vasodilation, ST depression

Digestive: dysphagia, eructation, flatulence, gastrointestinal disorder, increased appetite, nausea and vomiting, stomatitis, ileus

Hemic and Lymphatic: lymphadenopathy

Metabolic and Nutritional: dehydration, edema, hyponatremia, peripheral edema, syndrome of inappropriate antidiuretic hormone secretion, thirst

Nervous: abnormal gait, agitation, amnesia, depersonalization, depression, emotional lability, hallucination, hyperkinesia, hypesthesia, hypotonia, malaise, paresthesia, seizures, speech disorder, stupor, tinnitus, tremor, vertigo, withdrawal syndrome with or without seizures

Respiratory: cough increased, pharyngitis, voice alteration

Skin: dry skin, exfoliative dermatitis, urticaria

Special Senses: abnormal vision, taste perversion

Urogenital: dysuria, hematuria, impotence, polyuria, urinary retention, urination impaired

DRUG ABUSE AND DEPENDENCE (Addiction)

OxyContin® is a mu-agonist opioid with an abuse liability similar to morphine and is a Schedule II controlled substance. Oxycodone products are common targets for both drug abusers and drug addicts. Delayed absorption, as provided by OxyContin tablets, is believed to reduce the abuse liability of a drug.

Drug addiction (drug dependence, psychological dependence) is characterized by a preoccupation with the procurement, hoarding, and abuse of drugs for non-medicinal purposes. Drug dependence is treatable, utilizing a multi-disciplinary approach, but relapse is common. Iatrogenic "addiction" to opioids legitimately used in the management of pain is very rare. "Drug seeking" behavior is very common to addicts. Tolerance and physical dependence in pain patients are *not* signs of psychological dependence. Preoccupation with achieving adequate pain relief can be appropriate behavior in a patient with poor pain control. Most chronic pain patients limit their intake of opioids to achieve a balance between the benefits of the drug and dose-limiting side effects.

Physicians should be aware that psychological dependence may not be accompanied by concurrent tolerance and symptoms of physical dependence in all addicts. In addition, abuse of opioids can occur in the absence of true psychologi-

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