



Prescription Drug Monitoring Program Training and Technical Assistance Center

Technical Assistance Guide No. 02-13

Morphine Milligram Equivalents Calculator

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For Social Policy and Management

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May 1, 2013

Introduction

There has been an increase in the abuse of prescription opioids and in overdose deaths involving these medications. Studies have shown that opioid usage for more than three (3) months can lead to tolerance and dependence resulting in higher dosages being prescribed to a patient. As dosage increases, the likelihood of an adverse reaction increases. Many research experts, federal agencies (e.g., CDC, BJA, SAMHSA) and some PDMPs use the amount of daily morphine milligram equivalents (MMEs) prescribed to better gauge the abuse and overdose potential of opioids.

Morphine is widely regarded as the ‘gold standard’ for the treatment and management of moderate to severe pain and, therefore, is used as the reference point for other opioids. Evidence suggests that a patient, receiving more than 100mg daily MMEs, is nine (9) times more likely to overdose with 12% of those resulting in death. Identifying at-risk patients is a crucial first step towards improving patient safety and increasing prescriber awareness.

Converting drugs to their MMEs measurements will assist Prescription Drug Monitoring Programs (PDMPs), regulatory boards, enforcement agencies, and other stakeholders in determining the seriousness of the problem, evaluating the appropriateness of the prescribing and dispensing of these drugs, and assisting in prevention and treatment efforts.

NOTE: Opioid dosage thresholds are based on overdose risk when opioids are prescribed for pain and should not guide dosing of Medication Assisted Treatment (MAT) for opioid use disorders.

To assist PDMPs in calculating MMEs and provide a better assessment of the prescription drug problem, the PDMP Training and Technical Assistance Center (TTAC) partnered with Len Paulozzi, MD, MPH, from the Centers for Disease Control and Prevention, to develop a MME Calculator Tool (Calculator). The Calculator allows manual input of prescription data for a single or small number of prescriptions. The Calculator is ideal for use in an office setting or in the field.

Daily MME Conversion Formula:

The Calculator has the MME conversion formula (below) built in:

$$\frac{(\text{Drug Strength}) * (\text{Drug Quantity}) * (\text{MME Conversion Factor})}{(\text{Days Supply})}$$

Drug Strength:	automatically appears when user inputs the NDC number or selected from a list when user inputs the medication name
Drug Quantity:	located in the PDMP prescription record
MME Conversion Factor:	automatically appears when other fields are inputted
Days Supply:	located in the PDMP prescription record

EXCEPTIONS: Fentanyl and Buprenorphine patches are two (2) important exceptions to using the above formula to compute MMEs which are built into the Morphine Equivalent Calculator tool. The exception only applies to the Fentanyl and Buprenorphine patches; **not** the other dosage forms of either medication.

Typically, patients will be prescribed a Fentanyl or Buprenorphine patch for use every three (3) or seven (7) days, respectively. However, the timeframe for a patch may vary depending upon the doctor's instructions. Therefore, even though the duration of use of each patch may be prescribed for less than the typical number of days, the quantity of medication a patient receives each day remains constant.

EXAMPLE: 10 Fentanyl patches are typically prescribed for thirty (30) days (the Days Supply field in the PDMP data is equal to 30). However, some prescriptions might specify ten (10) patches over twenty (20) days.

Consequently, a standard has been established to account for possible variances in the length of time a patch is worn. The standard is based on the length of time a patient would normally be using the patch: three (3) days for Fentanyl and seven (7) days for Buprenorphine. In order for the formula to work properly and compute the MME accurately, the Days Supply value is automatically changed to equal three (3) times the quantity for Fentanyl patches and seven (7) times the quantity for Buprenorphine patches; regardless of the Days Supply value written on the prescription.

EXAMPLE: 10 Fentanyl patches are prescribed for twenty (20) days. Since a Fentanyl patch is typically used for three (3) days, the 'Days Supply' value should be thirty (30) for computing the MME.

Instructions on how to use the Calculator

The Calculator was created for PDMP Administrators and other authorized users of PDMP data to use in evaluating daily MMEs for a small number of patients or prescriptions. The Calculator requires manual entry of information for each prescription.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

There are two (2) ways to use the Calculator: search by NDC or search by Drug Name (Brand or Generic).

A) Search by NDC

1. Enter the National Drug Code (NDC) in the first box of the form.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

- Press the 'Enter' key. The Calculator will automatically populate the drug name, drug dosage form, and drug strength boxes.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: | Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: | **Morphine Equivalent Conversion Factor:**

- The cursor will be moved to the Enter Quantity Dispensed box. From the information on the prescription, enter the total quantity dispensed.
- Press the 'Enter' key to move the cursor to the Enter Number of Days Supplied of Drug box.
- From the information on the prescription, enter the days supplied as indicated by the prescriber. If the prescription does not specifically list the number of days supplied, it can be determined from the directions written by the prescriber.

EXAMPLE: 180 hydrocodone tablets are prescribed to be taken one every four hours each day (six tablets per day). The 'Days Supply' value will be thirty (30). The formula is (Drug Quantity) divided by (Daily Dosage) equals (Days Supplied) or $(180) / (6) = 30$.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: | Enter Number of Days Supplied of Drug:

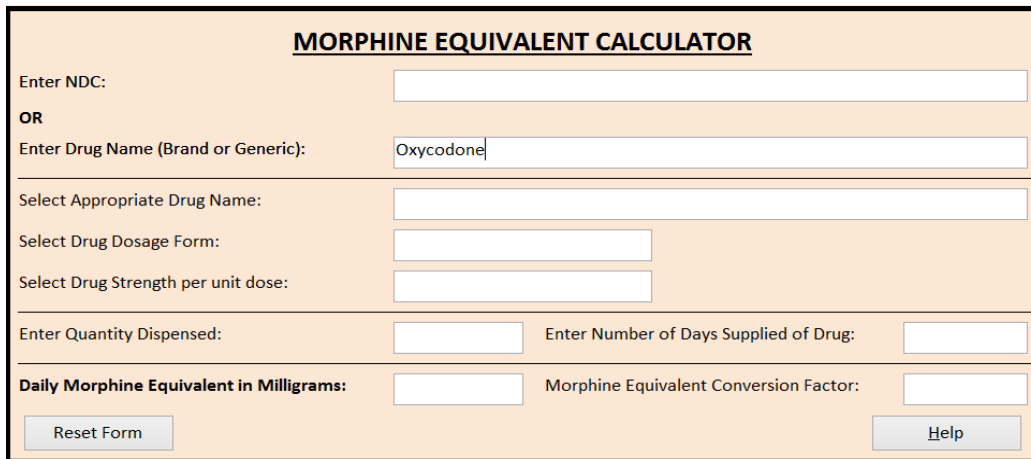
Daily Morphine Equivalent in Milligrams: | **Morphine Equivalent Conversion Factor:**

6. Press the 'ENTER' key to display the Daily Morphine Equivalent in Milligrams.

B) Search by Drug Name (Brand or Generic)

1. Enter the drug name or ingredient in the second box of the form. The existing medications will be retrieved from a file compiled by the CDC. It is recommended that only a portion of the drug name be inputted.

EXAMPLE: The Calculator uses a 'string' value for matching drug names; which means that it will retrieve all drug names that contain the search criteria sequence any place in the name. Hydrocodone can be listed as hydrocodone or hydrocodone bitartrate in the medication file; searching by hydrocodone will retrieve all medications with hydrocodone any place in the drug name field.



MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

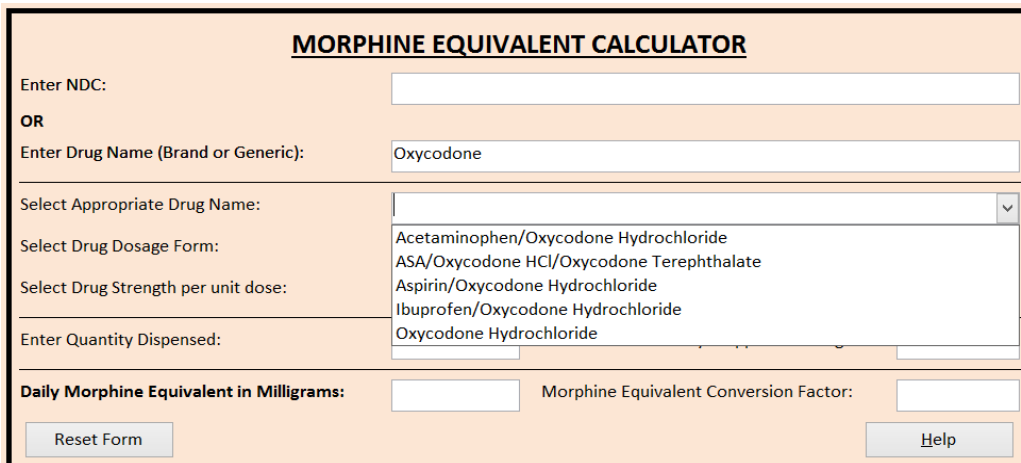
Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

2. Press the 'Enter' key to move the cursor to the Select Appropriate Drug Name box.
3. Click on the down arrow on the right side of the box. A drop-down list will appear with all the medications that match the search criteria.



MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

4. Select the appropriate drug name from the list.
5. Press the 'Enter' key to move the cursor to the Select Drug Dosage Form box.
6. Click on the down arrow on the right side of the box. A drop-down list will appear with all the available drug dosage forms for that medication.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

7. Select the appropriate drug dosage form from the list.
8. Press the 'Enter' key to move the cursor to the Select Drug Strength per unit dose box.
9. Click on the down arrow on the right side of the box. A drop-down list will appear with all the available drug strengths for that medication.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

10. Select the appropriate drug strength from the list.
11. Press the 'Enter' key to move the cursor to the Enter Quantity Dispensed box.
12. From the information on the prescription, enter the total quantity dispensed.

13. Press the 'Enter' key to move the cursor to the Enter Number of Days Supplied of Drug box.
14. From the information on the prescription, enter the days supplied as indicated by the prescriber. If the prescription does not specifically list the number of days supplied, it can be determined from the directions written by the prescriber.

EXAMPLE: 180 hydrocodone tablets are prescribed to be taken one every four hours each day (six tablets per day). The 'Days Supply' value will be thirty (30). The formula is (Drug Quantity) divided by (Daily Dosage) equals (Days Supplied) or $(180) / (6) = 30$.

MORPHINE EQUIVALENT CALCULATOR

Enter NDC:

OR

Enter Drug Name (Brand or Generic):

Select Appropriate Drug Name:

Select Drug Dosage Form:

Select Drug Strength per unit dose:

Enter Quantity Dispensed: Enter Number of Days Supplied of Drug:

Daily Morphine Equivalent in Milligrams: Morphine Equivalent Conversion Factor:

15. Press the 'ENTER' key to display the Daily Morphine Equivalent in Milligrams.

NOTE: The Morphine Equivalent Calculator Tool is available by request from the TTAC. To request, send an email to: info@pdmpassist.org. The Morphine Equivalent Calculator Tool is intended for use by PDMPs and other governmental officials and is not intended for use in a clinical setting.

This project was supported by Grant No. 2010-DG-BX-K088 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime. Points of view or opinions in this document are those of the author and do not represent the official position or policies of the U.S. Department of Justice.

