

### Name(s)

- **Generic:** warfarin (WAR far in) | **Brand:** Coumadin, Jantoven

### Therapeutic Category

- Anticoagulant | Vitamin K Antagonist

### Indication(s)

1. **Myocardial infarction (MI):** Warfarin is used to reduce systemic embolism risk after MI.
2. **Thromboembolic complications:** Warfarin is used as a preventative measure as well as in the treatment of various thromboembolic disorders such as venous and pulmonary thrombosis. It is also beneficial in treating and preventing complications due to cardiac valve replacements and embolic complications secondary to atrial fibrillation. It is important to note that warfarin does not reverse damage but rather to prevent additional damage.

### Dosage Form & Strength

- **Tablet:** 1 mg, 2 mg, 2.5 mg, 3 mg, 4 mg, 5 mg, 7.5 mg, 10 mg

### Dosing by Indication

- **Dosing Adults on Anticoagulation Therapy:**
  - There is high variability due to genetic variations between patients as well as other factors such as diet, age, and race.
  - **INR** stands for **International Normalized Ratio** and is a measurement used for measuring the level of therapeutic effect of the anticoagulation. A high value corresponds with a high level of anticoagulation.
  - It is also important to note that INR elevation is often seen between 24-48 hours but that INR may not represent therapeutic anticoagulation.
  - Unless guided by a patient-specific factor (VKORC1, CYP2C9, race, age, etc.) initiate dosing at **5 mg po qd for 3 days**. Check INR the morning of day 4. If...
    - INR <1.5                      Give pt 7.5-10 mg po qd for 2-3 days
    - INR 1.5-1.9                  Give pt 5 mg po qd for 2-3 days
    - INR 2-3                         Give pt 2.5 mg po qd for 2-3 days
    - INR 3.1-4                      Give pt 1.25 mg po qd for 2-3 days
    - INR >4                         Hold doses until INR is <3
  - As mentioned dosing is highly pt-specific and dosing must change accordingly. For example; if a pt-specific **sensitivity** exists initiate at a **lower dose**. Now for this patient, **initiate 2.5 mg po qd for 3 days**. Check INR the morning of day 4. If...
    - INR <1.5                      Give pt 5-7.5 mg po qd for 2-3 days
    - INR 1.5-1.9                  Give pt 2.5 mg po qd for 2-3 days
    - INR 2-3                         Give pt 1.25 mg po qd for 2-3 days
    - INR 3.1-4                      Give pt 0.5 mg po qd for 2-3 days
    - INR >4                         Hold doses until INR is <3
  - General maintenance dose is between 2-10 mg po qd. Maintenance dosing is based on a stable and therapeutic INR based on intensity. A **regular intensity** of anticoagulation has an INR goal between **2-3** while **high-intensity** is between **2.5-3.5**. Maintenance dosing nomograms may vary from institution. An example for regular intensity anticoagulation dosing is as follows:
    - Patient is subtherapeutic (LOW):
      - **INR < 1.5** | Increase weekly dose by 10-20% or one time dose between 1.5 to 2 times the daily maintenance dose.
      - **INR 1.5-1.7** | Increase weekly dose by 5-15% or one time dose between 1.5 to 2 times the daily maintenance dose.
      - **INR 1.8-1.9** | If last two INRs were in range and no explanation for change do not adjust dose. If clinical judgment warrants dose change, increase weekly dose by 5-15% or one time dose between 1.5 to 2 times the daily maintenance dose.
    - INR in range:





around 4 hours | **Duration of Action** is between 2-5 days | **Half-Life Elimination** is between 20-60 hours with an average of 40 hours | Highly **protein bound** at 99%

## Special Populations & Considerations

- **Hepatically impaired** patients experience a decreased metabolism of warfarin while renally impaired patients generally respond as expected.
- **Elderly** patients 60 years of age and older have a higher sensitivity regarding INR responses
- **Race** plays a role in the **Asian** population requiring lower initial doses and lower maintenance doses.
- **Pharmacogenetics** is an important factor to consider. **VKORC1 and CYP2C8 genetic variations** will aid in determining variability with patient dosing
- **Pregnancy:** If reproductive potential exists pt should use contraceptive during therapy and for 1 month after last dose of warfarin. Warfarin crosses placenta and teratogenic effects have been reported in first trimester. Pregnant women that require anticoagulant that are high-risk patients and must be on an anticoagulant data suggests the use of LMWH or an adjusted-dose heparin but always refer to most current data and consider patient-specific factors.

## Side Effect

- Nausea, abdominal pain, loss of appetite, diarrhea, dizziness
- **Serious side effects that require immediate attention:** Bleeding gums, blood in urine/stool, blurred vision, chest pain, difficulty breathing/swallowing, confusion.

**BLACK BOX WARNING: Bleeding Risk** – May cause major and/or fatal bleeding. Monitor INR regularly for all patients. Monitor all drug and dietary changes on warfarin therapy. Teach patients on how to measure and minimize bleed risk.

## Drug Interactions

- Acetaminophen may enhance anticoagulant effects in doses exceeding 1.3-2 grams per day for multiple days.
- Alcohol may decrease effects
- Barbituates may increase the metabolism of warfarin. Dose increases between 30-60% may be needed while on barbituates.
- Clopidogrel and NSAIDs may enhance anticoagulant effects of warfarin
- Dose adjustments should be made if patient is on any CYP2C9 inducers/inhibitors

## Monitoring Parameters

- International Normalized Ratio (INR)
  - **Initiation:** Daily if inpatient; outpatient 3-5 days if stable and 1-3 days if unstable
  - **Maintenance:** If stable every 1-3 days, if unstable daily; If routine f/u every 4-12 weeks if stable and every 1-2 weeks if unstable. If dose was held recheck in 1-2 days. If dose adjusted (today) recheck w/in 1-2 weeks. If dose adjusted ( $\leq 2$  weeks ago) recheck w/in 2-4 weeks.
- Genetic testing for CYP2C9 and VKORC1 genotype prior to initiation
- Irregular bleeding and bruising; Kidney function; Dietary changes

## Patient Counseling Information

- Used to treat blood clots and thins blood to lower chance of heart attack, stroke, and death.
- Can be taken w/ or w/o food.
- Usually administered once daily at the same time each day
- High vitamin K foods such as leafy greens inhibit anticoagulation so patients should not make drastic changes diet.

## Reference(s)

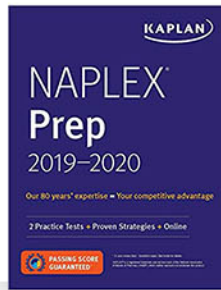
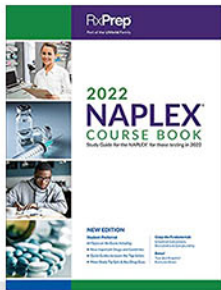
- <https://www.drugs.com/ppa/warfarin.html>
- <https://www.webmd.com/drugs/2/drug-3949/warfarin-oral/details>



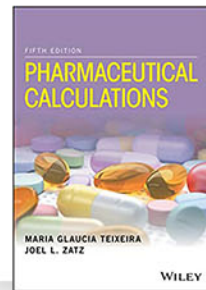
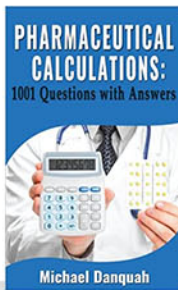
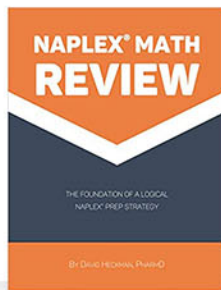
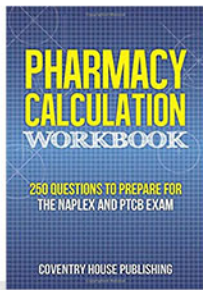


# PREPARE FOR SUCCESS!

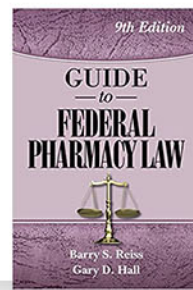
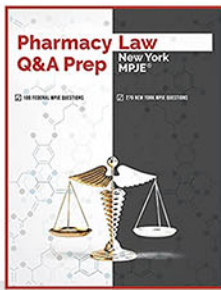
## Comprehensive (NAPLEX)



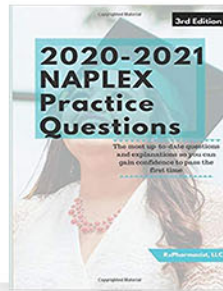
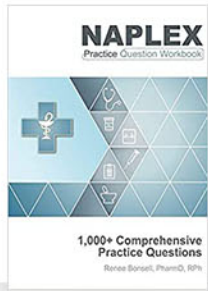
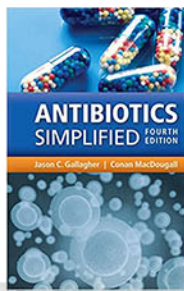
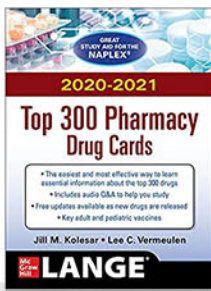
## Calculations (NAPLEX)



## Pharmacy Law (MPJE)



## Supplemental



# DRUG CARDS DAILY

Monday at 7 am EST  
(6 am CST, 4 am PST)

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So you landed that perfect job offer or got the perfect match for your PGY1 and now the **ONLY** thing standing in your way is passing the NAPLEX and MPJE.

Here are some NAPLEX & MPJE prep recommendations to help you do everything you can to **pass the first time!**

## HEY STUDENT!

When I was P1 one of the best pieces of advice I got from those before me was to use a NAPLEX Prep book while learning each topic.

This helps focus your learning and the repetition helps to retain info and indirectly prepare you for the NAPLEX

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