Patient Population:
See Protocol Section 3.0 for Complete Eligibility Details

Step 0 Pre-Registration:
- Must be ≥ 18 years of age; ECOG PS 0-2
- Must be previously diagnosed with multiple myeloma and be on lenalidomide maintenance with ≥ 10 mg daily dose (≥ 5 mg for patients with creatinine clearance 30-60 mL/min) for at least 10 months and no more than 15 months after an early autologous stem cell transplantation (SCT ≤ 12 months of diagnosis); must not be on lenalidomide maintenance therapy for > 30 days prior to start of treatment on Step 1
- Must be able to undergo a diagnostic bone marrow aspirate following pre-registration to Step 0
- Must not have primary refractory/progressive disease on a proteasome inhibitor-based regimen during induction therapy prior to stem cell transplant
- Must not be on concurrent chemotherapy/any ancillary therapy considered investigational (bisphosphonates are allowed)
- Must have been able to maintain at least 10 mg dose of lenalidomide without growth factor support (at least 5 mg if creatinine clearance 30-60 mL/min)
- Must not have known GI disease/GI procedure that could interfere with the oral absorption/tolerance of ixazomib/lenalidomide, including difficulty swallowing
- Must not have known hepatitis B surface antigen-positive status or known/suspected active hepatitis C infection

Step 1 Randomization:
- Adequate lab values; no uncontrolled intercurrent illness
- Must not have lenalidomide maintenance therapy for > 30 days prior to start of treatment on Step 1
- Must have evidence of residual disease by central MRD testing or by presence of monoclonal protein in serum/urine
- Must not have Grade 2 or higher peripheral neuropathy/Grade 1 peripheral neuropathy with pain; or Grade 2 or higher diarrhea in the absence of antidiarrheals (CTCAE)

Treatment Plan:
See Protocol Section 5.0 for Complete Treatment Details

Arm X (Arm A [ixazomib] and B [placebo]):
- Double-blind trial
- Patients should be on at least 81 mg acetylsalicylic acid (ASA) daily while receiving lenalidomide
- Lenalidomide: 10 mg PO daily days 1-28
- Ixazomib/Placebo: 4mg PO days 1, 8, 15
- Repeat cycle every 28 days until disease progression or unacceptable toxicity

NOTES:
- Patients with creatinine clearance 30-60 mL/min, lenalidomide will be reduced to 5 mg PO daily
- Lenalidomide will be taken whole, with or without food
- Ixazomib/placebo are taken on an empty stomach, 1 hour before or 2 hours after food; capsules must be swallowed whole with water
  - Missed/delayed doses can be taken only if the next scheduled dose is ≥ 72 hours away; if vomiting occurs after a dose, the patient should not repeat the dose

Lenalidomide Fertility Instructions:
- All study participants must be registered into the mandatory REMS program, and be willing and able to comply with the requirements of REMS
- Patients of childbearing potential must have negative serum or urine pregnancy testing per protocol, and must either commit to continued abstinence or two acceptable methods of birth control (at the same time), per protocol
- Patients must agree to abstain from donating sperm and blood per protocol

Patient Enrollment
All Sites: Oncology Patient Enrollment Network (OPEN) https://open.ctsu.org

Protocol Information

Please Enroll Your Eligible Patients!
1. Eligibility criteria for Step 1 randomization will be determined by either central MRD assessment at Mayo Clinic or local immunohistochemistry test results.

Step 0: MDR negative

Step 1: MDR positive

2. Treatment is blinded to randomization will indicate that patient is on Arm A.

3. For patients with creatinine clearance 30-60 mL/min lenalidomide dose will be reduced to 5 mg PO daily.

Unacceptable toxicity
Continue treatment until progression of disease or

randomization

Offer Study

MRD negative

MRD positive

Off-study

Prel lenalidomide maintenance
High-v. standard
Stratification by IMWG criteria:
Minimal residual disease