Plasmapheresis removes damaging monoclonal light chains and has been shown to improve or reverse renal failure (Burnette, Leung, & Rajkumar, 2011; Clark, 2007; Finkel et al., 2016; Hutchison et al., 2007). The use of high-cutoff dialyzers may effectively remove serum free light chains and can lead to improved renal function (Finkel et al., 2016; Hutchison et al., 2007, 2009) or independence from hemodialysis among patients receiving a bortezomib-based regimen (Bridoux et al., 2016). Temporary or permanent hemodialysis is indicated if symptomatic uremia becomes an issue.

Evidence-Based Recommendations for Simultaneous Renal Impairment and Active Multiple Myeloma

**LEVEL OF EVIDENCE I**

- The IMF NLB recommends prompt initiation of effective MM therapy. In line with International Myeloma Working Group recommendations that renal impairment should be treated with bortezomib-based regimens (Dimopoulos, Sonneveld, et al., 2016), the IMF NLB recommends the use of bortezomib as the cornerstone treatment in the management of these patients.

**LEVELS OF EVIDENCE I–III**

- The IMF NLB recommends prompt treatment using classes of drugs approved by the U.S. Food and Drug Administration to treat patients with relapsed or refractory MM and renal impairment. These include immunomodulatory agents like the following:
  - Level of evidence I: Thalidomide; proteasome inhibitors, such as bortezomib (Dimopoulos, Sonneveld, et al., 2016; Picot, Cooper, Bryant, & Clegg, 2011)
  - Level of evidence III: Lenalidomide and pomalidomide; carfilzomib and ixazomib; monoclonal antibodies, such as elotuzumab and daratumumab

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**FIGURE 4.**

**PATIENT EDUCATION TIP SHEET: RENAL CARE PLAN FOR PATIENTS WITH MM**

**HISTORY AND PHYSICAL EXAMINATIONS**

- Regular review of medications, changes in medical history, and physical examination
- Call your primary care provider for annual physical examination.
- Your hematology-oncology practitioner will review medications at each visit.

**BLOOD TESTS**

- Perform CBC, CMP, SPEP, SIFE, 24-hour UPEP, UIFE, LDH, serum FLC assay, and beta-2 microglobulin every three months. Special tests for bone loss may be ordered on an individual basis.
- Contact your treating hematology-oncology provider for monitoring.

**BONE IMAGING**

- Long-term or late effects of chronic kidney disease include osteoporosis.
- Talk with your primary care provider or hematology/oncology provider about bone density scans to monitor your bone health.

**URINALYSIS**

- Check annually if not on pamidronate or zoledronic acid. Check quarterly if you are receiving one of these drugs.
- Contact your treating hematology-oncology provider for monitoring.

**NEPHROLOGIST OR KIDNEY SPECIALIST FOLLOW-UP**

- See nephrologist annually or as needed if change in creatinine or GFR occurs.
- Call your nephrologist or kidney specialist.

**DIAGNOSTIC IMAGING**

- Avoid the use of IV dye or contrast with PET, CT, or MRI scans.
- Any provider may order one of these tests. You should alert whoever is ordering these tests that you have a diagnosis of MM and that IV dye may not be safe.

**MEDICATIONS**

- Avoid the use of NSAIDs, such as ibuprofen. Many medications and over-the-counter supplements (including Chinese herbs) can worsen renal impairment, but others can be given safely at lower doses.

- Bisphosphonates (zoledronic acid and pamidronate) are often used to prevent bone fractures and can be used with caution. Your provider should check your kidney function before each dose.
- ESAs, such as darbepoetin alfa and erythropoietin, are used to treat anemia. These must be used with caution, and a CBC must be obtained before each dose.
- All medications should be reviewed with your provider before starting, including herbal and over-the-counter medications.

**DOSE ADJUSTMENTS**

- Tell your providers if you have a decrease in kidney functioning. Certain medications to treat your cancer or other health conditions, such as antibiotics, will require a dose reduction or change in the way the medicines are given (e.g., days of the week).
- Contact your healthcare team for monitoring.

**OTHER FACTORS**

- Maintain adequate hydration; 2.5 liters of fluid per day is recommended. It is important to avoid dehydration, particularly during hot days or if you have a raised temperature.

CBC—complete blood count; CMP—comprehensive metabolic panel; CT—computed tomography; ESA—erythropoiesis-stimulating agent; FLC—free light chain; GFR—glomerular filtration rate; LDH—lactate dehydrogenase; MM—multiple myeloma; MRI—magnetic resonance imaging; NSAID—nonsteroidal anti-inflammatory drug; PET—positron-emission tomography; SIFE—urine immunofixation; SPEP—serum protein electrophoresis; UIFE—urine protein electrophoresis.