

Case Studies for Nurses: Treatment Updates and Patient Care Insights in Multiple Myeloma

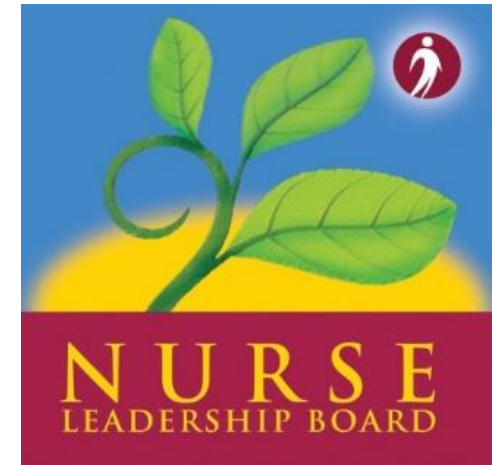
Slides available for download at:
<https://www.imf-ons.myeloma.org>
password: ons2025



Please help us start on time.
Please do not save seats. Please silence cell phones.

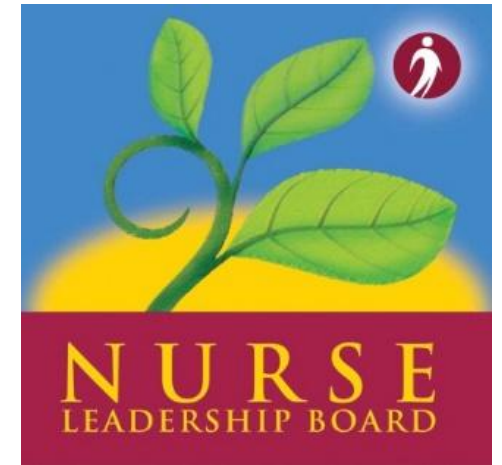
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ONS Disclosure

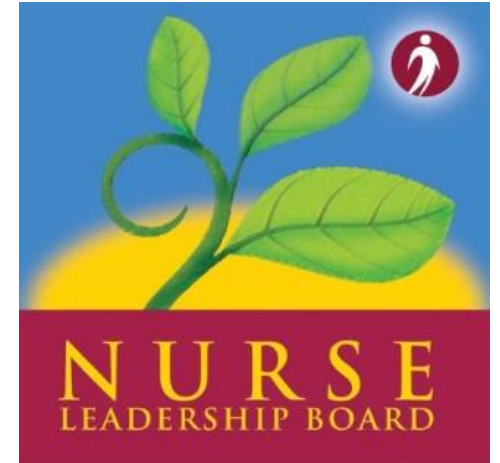
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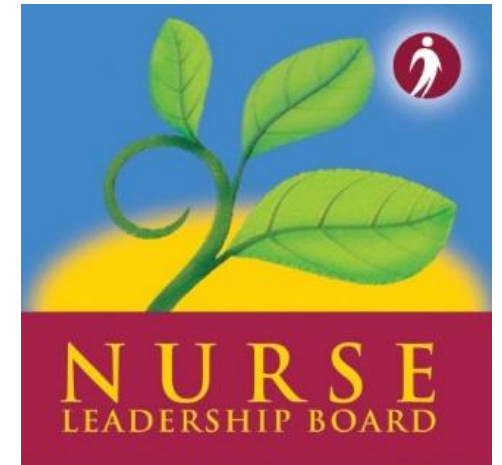
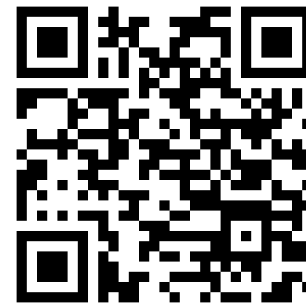
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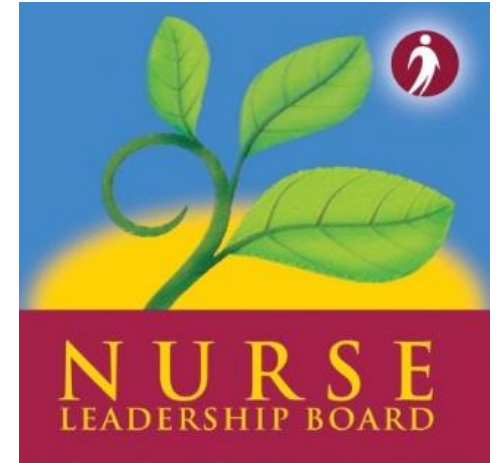
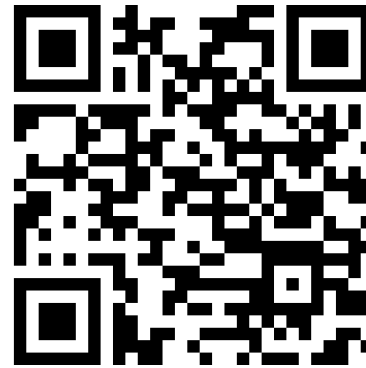
Please access full disclosures here:
<https://imf-ons.myeloma.org/disclosures/>



Patient names, demographics, and identifying characteristics have been masked to be HIPAA compliant.

Off-label use of drugs may be discussed.

Slides available for download at:
<https://www.imf-ons.myeloma.org>



Faculty Introductions



CHAIR

Beth Faiman, PhD, MSN, APRN-BC, AOCN®, BMTCN®, FAAN, FAPO

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New York, NY



Mary Steinbach, DNP, APRN

Huntsman Cancer Institute, University of Utah
Salt Lake City, UT

Learning Objectives

At the conclusion of the educational presentation, the participant will be able to:

1

Discuss AE management, patient/care partner education, therapy sequencing, and bridging therapy for the latest treatments for patients with multiple myeloma, including upfront quadruplet regimens, T-cell engagers (bispecific antibodies), CAR-T cell therapy, CD38 antibodies, XPO inhibitors, CELMoDs, and antibody-drug conjugates

2

Use tactics to enhance access to therapies and clinical trials, including best practices for transitions of care

3

Explain the importance of minimal residual disease (MRD) and identify treatment strategies to attain it

4

Identify disparities faced by patients with multiple myeloma and strategies to overcome these, including increasing participation in clinical trials (eg, health equity)

International Myeloma Foundation
800-452-CURE (2873)
<http://myeloma.org>

Newly Diagnosed Multiple Myeloma, Including Treatment Disparities

CASE 1: ANNE*

*HIPAA-compliant; not actual patient name.

Tiffany Richards, PhD, ANP-BC, AOCNP®

**Beth Faiman, PhD, RN, MSN, APRN-BC, AOCN, BMTCN,
FAAN**



CASE 1

Anne*

PATIENT NOTES:

- 60-year-old woman of African descent
- PMH: HTN, obesity
- Increased total protein on routine blood test

SPEP

Gamma spike

CRP

Unremarkable

Referred to hematology/oncology

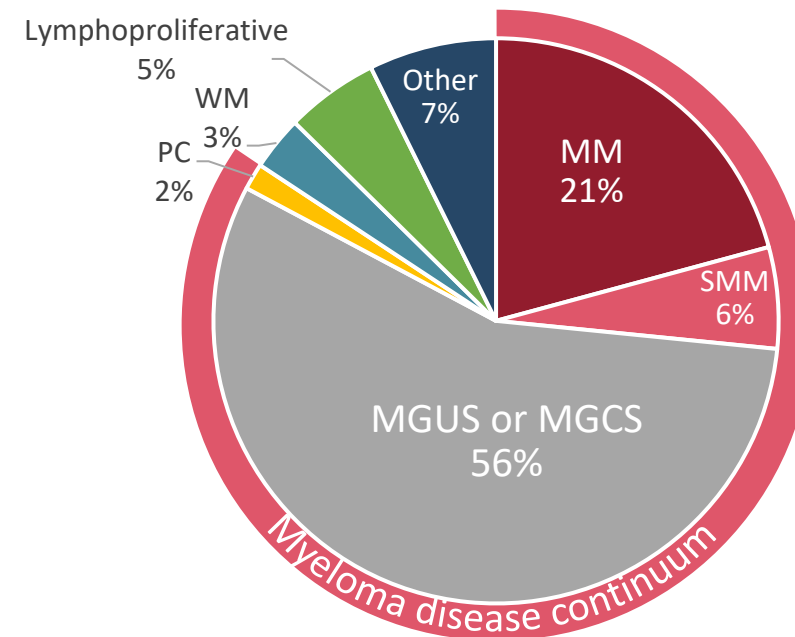


*HIPAA-compliant,
not actual patient
name, stock photo.

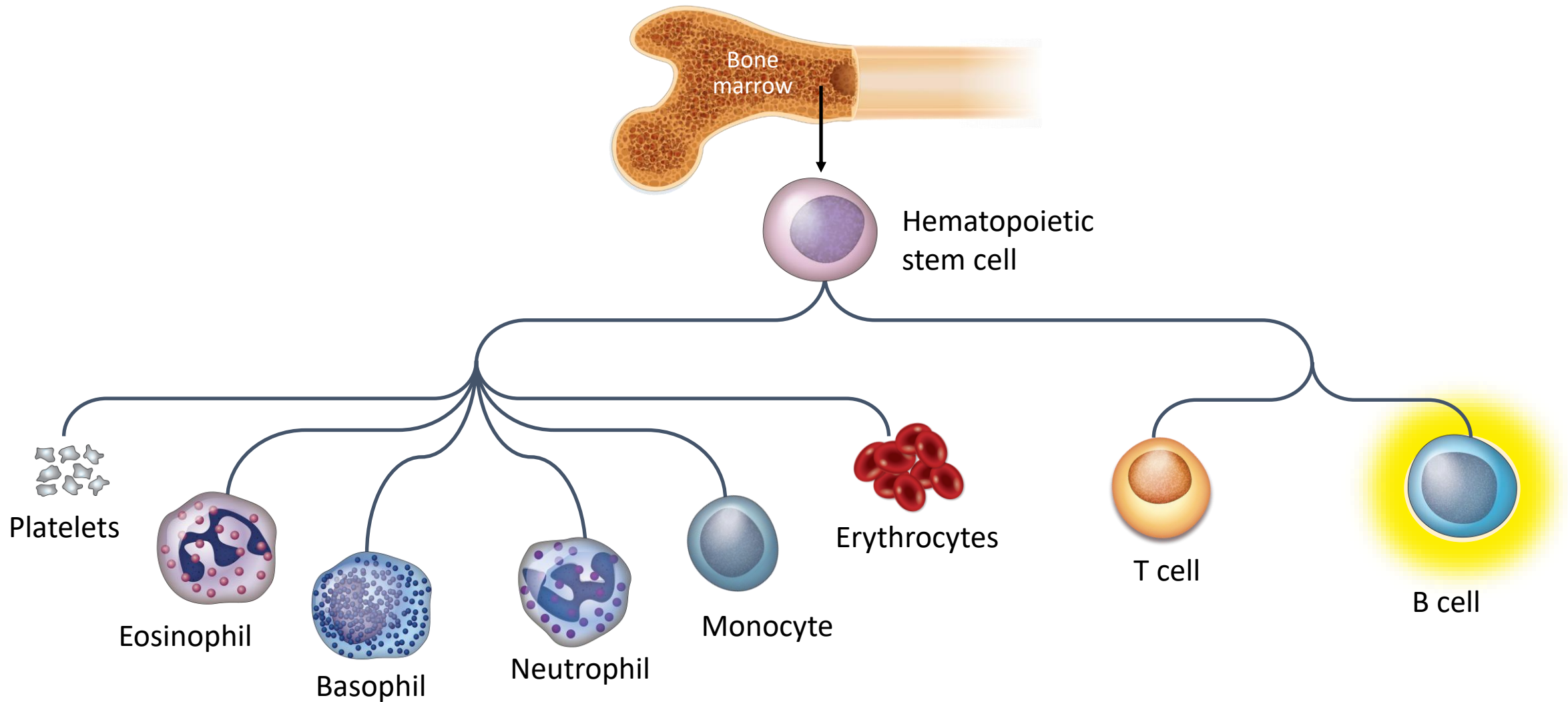
Reasons Someone May Have Monoclonal Protein

- ✓ Monoclonal gammopathy of undetermined significance (MGUS)
- ✓ Monoclonal gammopathy of clinical significance (MGCS)
- ✓ Smoldering multiple myeloma (SMM)
- ✓ Multiple myeloma (MM)
- ✓ Plasmacytoma (PC)
- ✓ Waldenström macroglobulinemia (WM)
- ✓ Amyloid Light Chain (AL) amyloidosis
- ✓ Plasma cell leukemia
- ✓ Malignant bone disease
- ✓ POEMS

Distribution of Monoclonal Gammopathies
Mayo Clinic Experience (N = 1423)

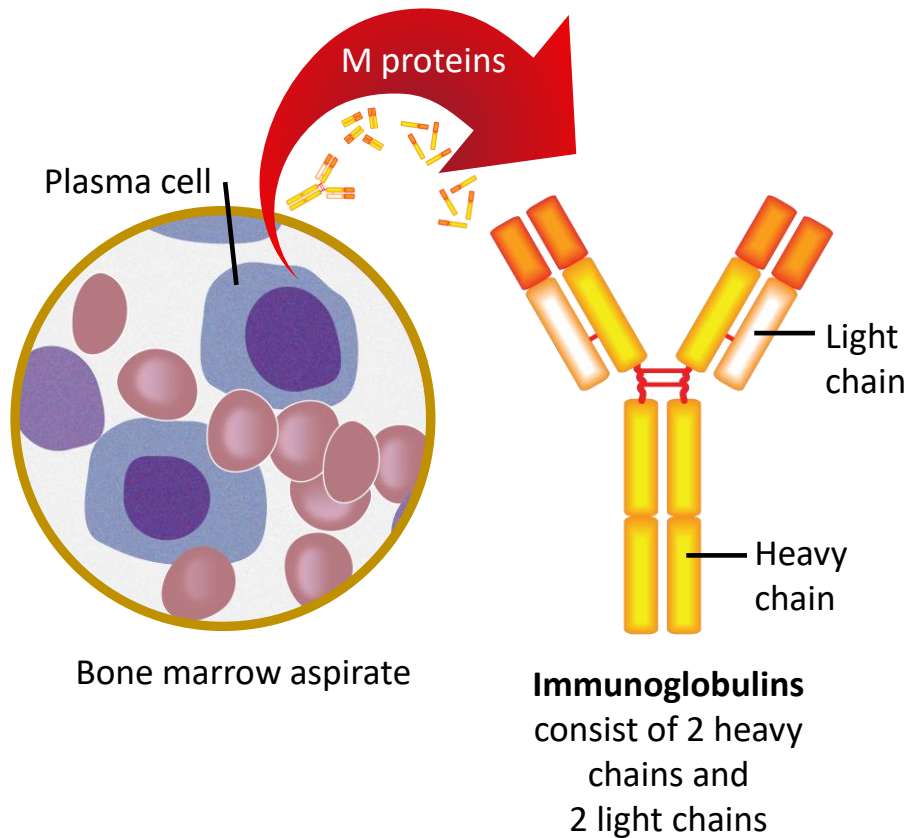


Hematopoietic Lineages

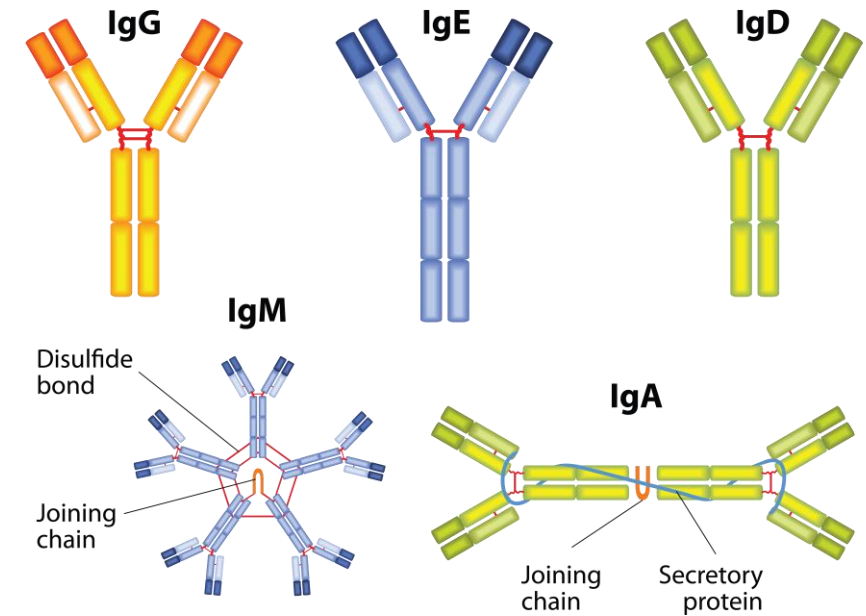
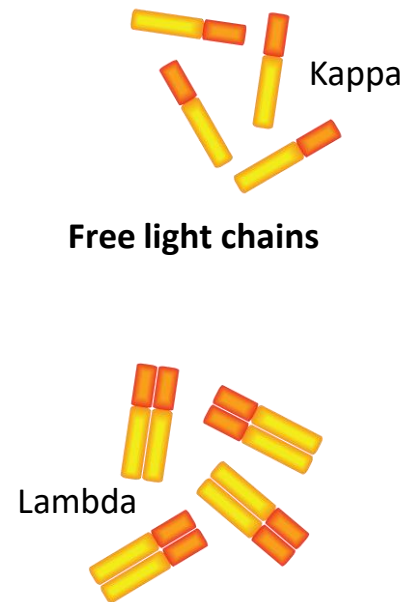


Pathobiology of Multiple Myeloma: A Brief Review

Monoclonal gammopathies begin with uncontrolled division of a single plasma cell, leading to abnormal production of monoclonal (M) proteins, consisting of an antibody (immunoglobulin) or a free light chain.



Free light chains that are over-produced are either all kappa or lambda; thus, the kappa-lambda ratio could be abnormal (< 0.26 or > 1.65)



Monoclonal gammopathies can lead to a number of conditions!

IMF: Raising Awareness via Public Service Announcement



Ice-T Talks Health Equity: Real Facts About Multiple Myeloma in the Black Community



Subscribe

IMF = International Myeloma Foundation.

Actor and Artist ICE-T Raises Awareness of Myeloma in the Black Community. IMF website. Accessed April 3, 2025. <https://www.myeloma.org/videos/actor-artist-ice-t-raises-awareness-myeloma-black-community>.

ICE-T Sets the Record Straight on Multiple Myeloma, It's Not Melanoma. IMF website. Accessed April 3, 2025. <https://www.myeloma.org/videos/psa-2-ice-t-sets-record-straight-multiple-myeloma-its-not-melanoma>.

**“Myeloma is
among the worst
of all cancers
for delayed
diagnosis.”**

Drayson M, et al.
Br J Haematol.
2024;204(2):476-486.



CASE 1



At what point should treatment start?

WORKUP

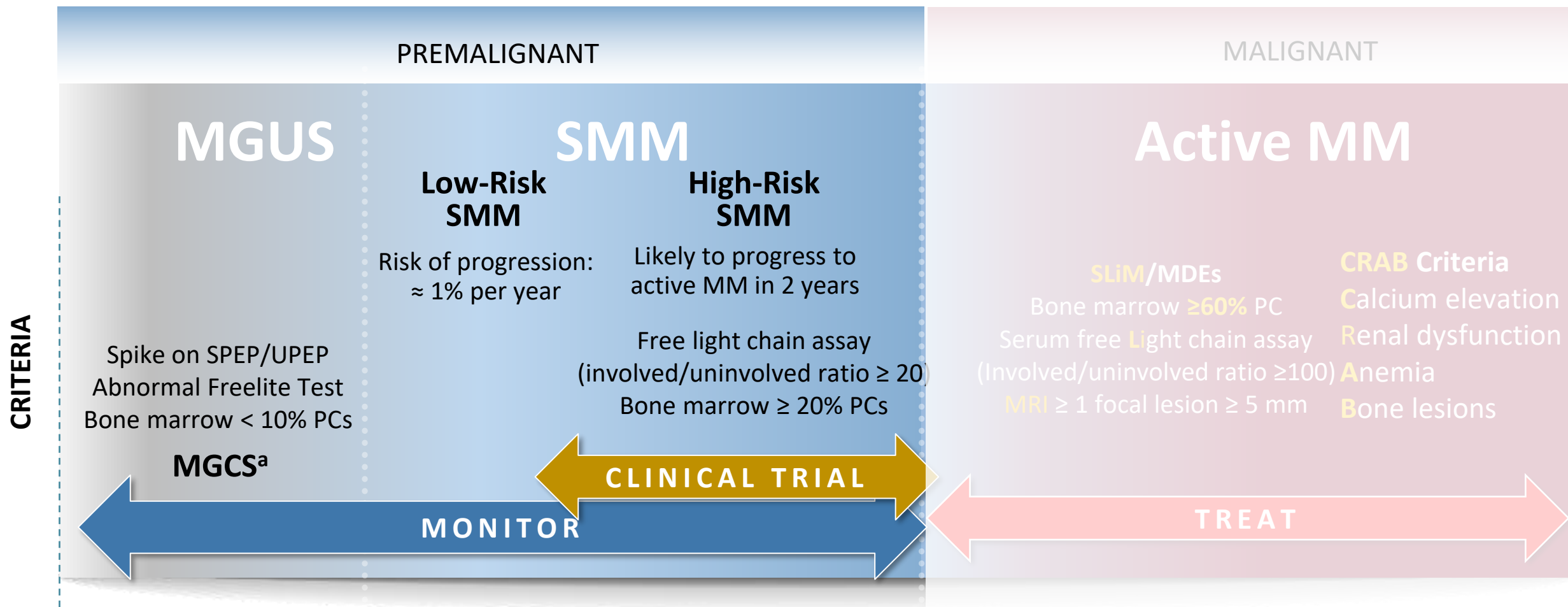
CBC	IgG	1100
	IgA	400
	IgM	100
	Platelets	WNL
CMP	Calcium	8.9 mg/dL (ULN: 10.6 mg/dL)
	Creatinine	0.9 mg/dL (ULN: 1.3 mg/dL)
Serum Free Light Chain Assay	Kappa light chain	56 g/dL (normal range: 3.3-19.4 g/dL)
	Lambda light chain	4.1 g/dL (normal range: 5.7 to 26.3 g/dL)
	κ/λ-light chain ratio	13.65 (ULN: 1.65)
Bone Marrow	Plasma cells	5% clonal plasma cells
	FISH	No abnormalities detected
Whole Body PET-CT	Nothing of note	
Diagnosis	MGUS → Monitoring	

*HIPAA-compliant, not actual patient name, stock photo.





Myeloma Continuum: Premalignant Conditions



^aMGCS does not meet criteria for myeloma but has a clinical manifestation. For kidney manifestation; kidney biopsy is the gold standard for diagnosis.

CRAB = calcium, renal, anemia, bone; MDE = myeloma-defining event; MGCS = monoclonal gammopathy of clinical significance; MGUS = monoclonal gammopathy of undetermined significance; MM = multiple myeloma; MRI = magnetic resonance imaging; PC = plasma clone; SLiM = PC $\geq 60\%$, light chain, MRI; SMM = smoldering multiple myeloma; SPEP = serum protein electrophoresis; UPEP = urine protein electrophoresis.

Rajkumar SV, et al. *Lancet Oncol.* 2014;15(12):e538-e548. Bridoux F, et al. *Kidney Int.* 2015;87(4):698-711. Terpos E, et al. *Lancet Oncol.* 2021;22(3):e119-e130. Hillengass J, et al. *Lancet Oncol.* 2019;20(6):e302-e312. Ludwig H, et al. *Lancet.* 2023;58:101910.



iStopMM Clinical Study: New Insights on MGUS



Is there a screening test for MM?

- **75,422** individuals screened in Iceland via serum sample between 2016 and 2020
- Represents **54%** of all Icelanders aged ≥ 40 years
- Analysis of study data has provided new insights into MM and related premalignant conditions

- **MGUS screening was feasible** and led to early diagnosis and treatment of MM and related disorders
 - MGUS screening was **not associated with any demonstrable harm**
 - **Increased rates of thrombotic events** in patients with MGUS (especially non-IgM MGUS)
- The **iSTOPMM model to predict patients with $\geq 10\%$ clonal PCs** in the bone marrow for individuals with IgG, IgA, or biclonal MGUS **performed well in an ethnically diverse Bronx, NY population^a**
- **Clonal plasma cells were more frequently detected** in bone marrow samples from individuals with **IgA MGUS than those with IgG MGUS**
 - **Absence of clonal PCs** correlated with a higher frequency of **transient M protein and an absence of disease progression**



WATCH FOR
New iStopMM results as analyses continue

^aOf the 190 patients analyzed, race: Black or African-American (52.6%), White (14.7%), Unknown (8.4%), Asian (2.1%) and Other (22.1%); Ethnicity: non-Hispanic/Latino (68.4%), Hispanic/Latino (23.2%), and unknown (8.4%).

FLC = free light chain; Ig = immunoglobulin; iStopMM = Iceland Screens Treats or Prevents Multiple Myeloma; M protein = monoclonal protein;

MGUS = monoclonal gammopathy of undetermined significance; MM = multiple myeloma; PC = plasma clone.

Gor R, et al. ASH 2024. Abstr #3307. Oskarsson JT, et al. ASH 2024. Abstr #1015. Rögnvaldsson S, et al. ASH 2023. Abstr #214. Rögnvaldsson S, et al. ASH 2023. Abstr #216. Long TE, et al. ASH 2023. Abstr #535.



AQUILA: Clinical Trial Treating High-Risk SMM With Daratumumab

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Daratumumab or Active Monitoring for High-Risk Smoldering Multiple Myeloma

M.A. Dimopoulos, P.M. Voorhees, F. Schjesvold, Y.C. Cohen, V. Hungria, I. Sandhu, J. Lindsay, R.I. Baker, K. Suzuki, H. Kosugi, M.-D. Levin, M. Beksac, K. Stockerl-Goldstein, A. Oriol, G. Mikala, G. Garate, K. Theunissen, I. Spicka, A.K. Mylin, S. Bringhen, K. Uttervall, B. Pula, E. Medvedova, A.J. Cowan, P. Moreau, M.-V. Mateos, H. Goldschmidt, T. Ahmadi, L. Sha, A. Cortoos, E.G. Katz, E. Rousseau, L. Li, R.M. Dennis, R. Carson, and S.V. Rajkumar, for the AQUILA Investigators*

ABSTRACT

BACKGROUND

Daratumumab, an anti-CD38 monoclonal antibody, has been approved for the treatment of multiple myeloma. Data are needed regarding the use of daratumumab for high-risk smoldering multiple myeloma, a precursor disease of active multiple myeloma for which no treatments have been approved.

METHODS

In this phase 3 trial, we randomly assigned patients with high-risk smoldering multiple myeloma to receive either subcutaneous daratumumab monotherapy or active monitoring. Treatment was continued for 39 cycles, for 36 months, or until confirmation of disease progression, whichever occurred first. The primary end point was progression-free survival; progression to active multiple myeloma was assessed by an independent review committee in accordance with International Myeloma Working Group diagnostic criteria.

RESULTS

Among the 390 enrolled patients, 194 were assigned to the daratumumab group and 196 to the active-monitoring group. With a median follow-up of 65.2 months, the risk of disease progression or death was 51% lower with daratumumab than with active monitoring (hazard ratio, 0.49; 95% confidence interval [CI], 0.36 to 0.67; $P < 0.001$). Progression-free survival at 5 years was 63.1% with daratumumab and 40.8% with active monitoring. A total of 15 patients (7.7%) in the daratumumab group and 26 patients (13.3%) in the active-monitoring group died (hazard ratio, 0.52; 95% CI, 0.27 to 0.98). Overall survival at 5 years was 93.0% with daratumumab and 86.9% with active monitoring. The most common grade 3 or 4

The authors' full names, academic degrees, and affiliations are listed in the Appendix. Dr. Dimopoulos can be contacted at mdimop@med.uoa.gr or at Alexandra General Hospital, National and Kapodistrian University of Athens, 80 Vasilissis Sofias Ave., 11528 Athens, Greece.

*A complete list of AQUILA Investigators is provided in the Supplementary Appendix, available at [NEJM.org](https://www.nejm.org).

This article was published on December 9, 2024, at [NEJM.org](https://www.nejm.org).

DOI: 10.1056/NEJMoa2409029

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“Among patients with high-risk smoldering multiple myeloma, subcutaneous daratumumab monotherapy was associated with a significantly lower risk of progression to active multiple myeloma or death and with higher overall survival than active monitoring.”

PFS at 60 months:

- **63.1%** daratumumab vs **40.8%** active monitoring
- HR^a 0.49 (95% CI, 0.36-0.67)
- **$P < 0.001$**

OS at 60 months:

- **93.0%** daratumumab vs **86.9%** active monitoring
- HR 0.52 (95% CI, 0.27-0.98)



WATCH FOR
Evolving
treatment
recommendations
for patients with
high-risk SMM

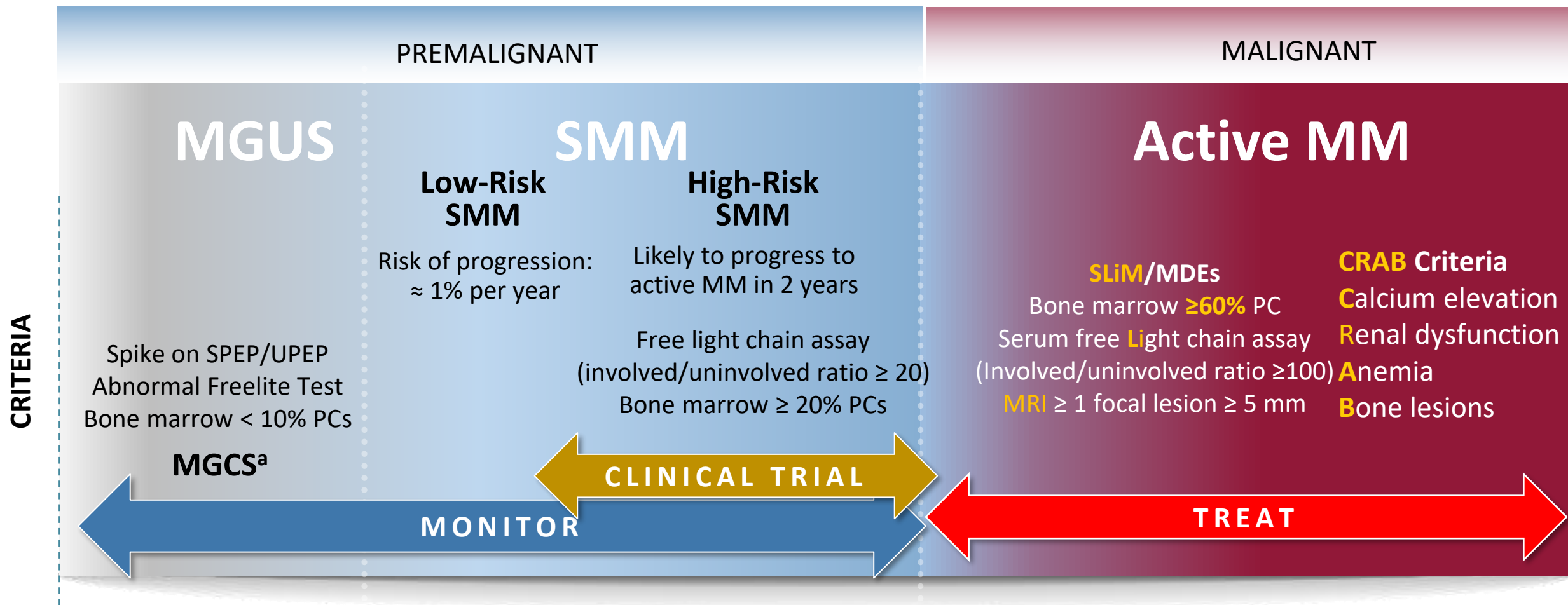
^aDisease progression or death.

HR = hazard ratio; PFS = progression-free survival; OS = overall survival; SMM = smoldering multiple myeloma.

Dimopoulos MA, et al. *N Engl J Med*. 2024. doi: 10.1056/NEJMoa2409029. [Online ahead of print].



Myeloma Continuum: Active Myeloma



^aMGCS does not meet criteria for myeloma but has a clinical manifestation. For kidney manifestation; kidney biopsy is the gold standard for diagnosis.

CRAB = calcium elevation, renal dysfunction, anemia, bone lesions; M-spike = monoclonal spike; MDE = myeloma-defining event; MGCS = monoclonal gammopathy of clinical significance; MGRS = monoclonal gammopathy of renal significance; MGUS = monoclonal gammopathy of undetermined significance; MM = multiple myeloma; MRI = magnetic resonance imaging; PC = plasma clone; SLiM = PC ≥ 60, light chain, MRI; SMM = smoldering multiple myeloma; SPEP = serum protein electrophoresis; UPEP = urine protein electrophoresis.

Rajkumar SV, et al. *Lancet Oncol.* 2014;15(12):e538-e548. Bridoux F, et al. *Kidney Int.* 2015;87(4):698-711. Terpos E, et al. *Lancet Oncol.* 2021;22(3):e119-e130. Hillengass J, et al. *Lancet Oncol.* 2019;20(6):e302-e312. Ludwig H, et al. *Lancet.* 2023;58:101910.



How Patients With Myeloma Commonly Present



ROUTINE PHYSICAL or MONITORING

- Patient with few/no symptoms
- Abnormal bloodwork or test result



VISIT FOR SPECIFIC COMPLAINT

- Bone pain, fatigue, or injury
- Abnormal test result (eg, x-ray, blood test)



EMERGENCY ROOM

- Severe pain—often spinal fractures
- Kidney failure

NON-EMERGENCY;
More time for shared decision-making

MEDICAL EMERGENCY;
Need immediate treatment!

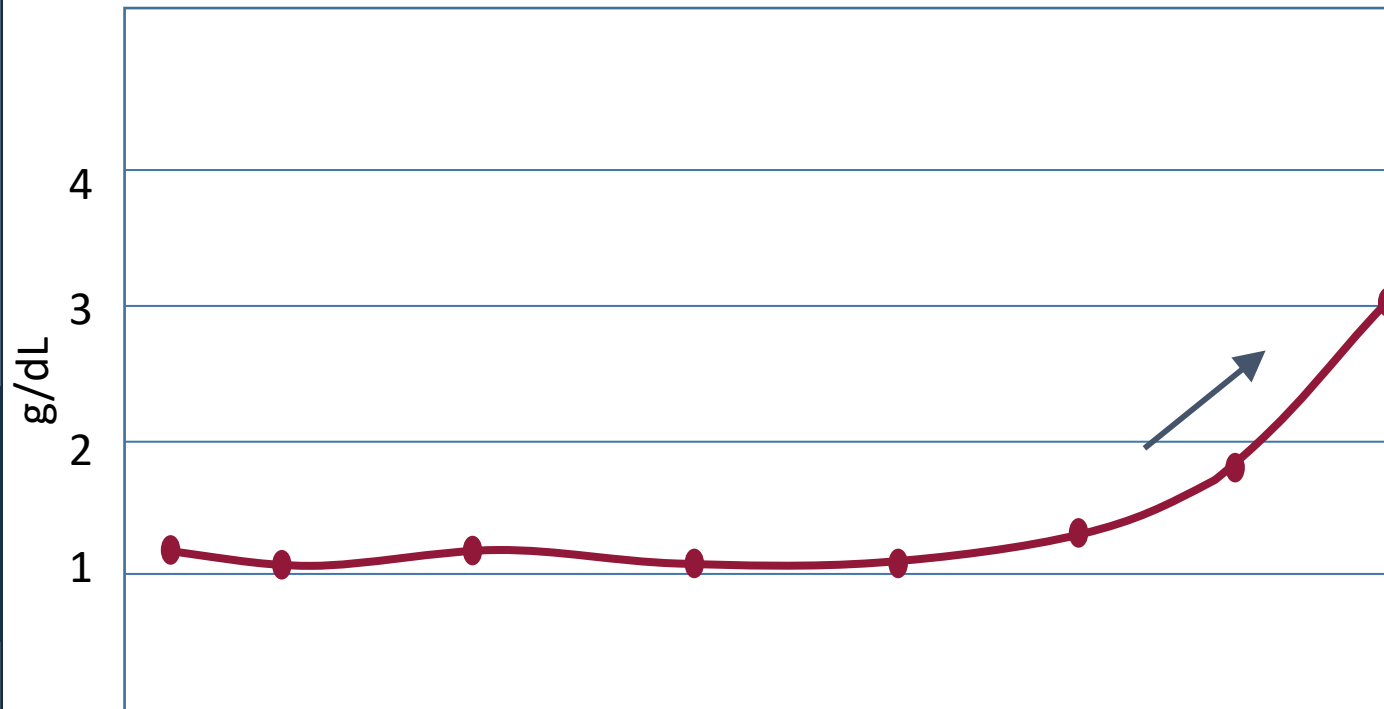
CASE 1



At what point should treatment start?

Anne*

Monoclonal protein



*HIPAA-compliant,
not actual patient
name, stock photo.

CASE 1



At what point should treatment start?

MYELOMA WORKUP

Bone Marrow	Plasma cells	70% clonal plasma cells
	FISH	Standard risk + t(11:14)
Blood	Calcium	8.7 mg/dL (ULN: 10.6 mg/dL)
	Albumin	4 mmol/L (LLN: 3.5 mmol/L)
	B2M	3.6 mg/dL (ULN: 2.64 mg/dL)
	LDH	120 U/mL (ULN: 250 U/mL)
	Creatinine	0.8 mg/dL (ULN: 1.3 mg/dL)
	Hgb	10.0 g/dL (normal range: 13.8-17.2 g/dL)
	Kappa light chain	89 g/dL (normal range: 3.3-19.4 g/dL)
	Lambda light chain	6.7 g/dL (normal range: 5.7 to 26.3 g/dL)
	κ/λ–light chain ratio	13.3 (ULN: 1.65)
Whole Body MRI	Lytic lesion at T10, no fractures, intact spinal canal	
Diagnosis	Active MM standard risk	



*HIPAA-compliant, not actual patient name, stock photo.



Diagnostic Workup for Multiple Myeloma

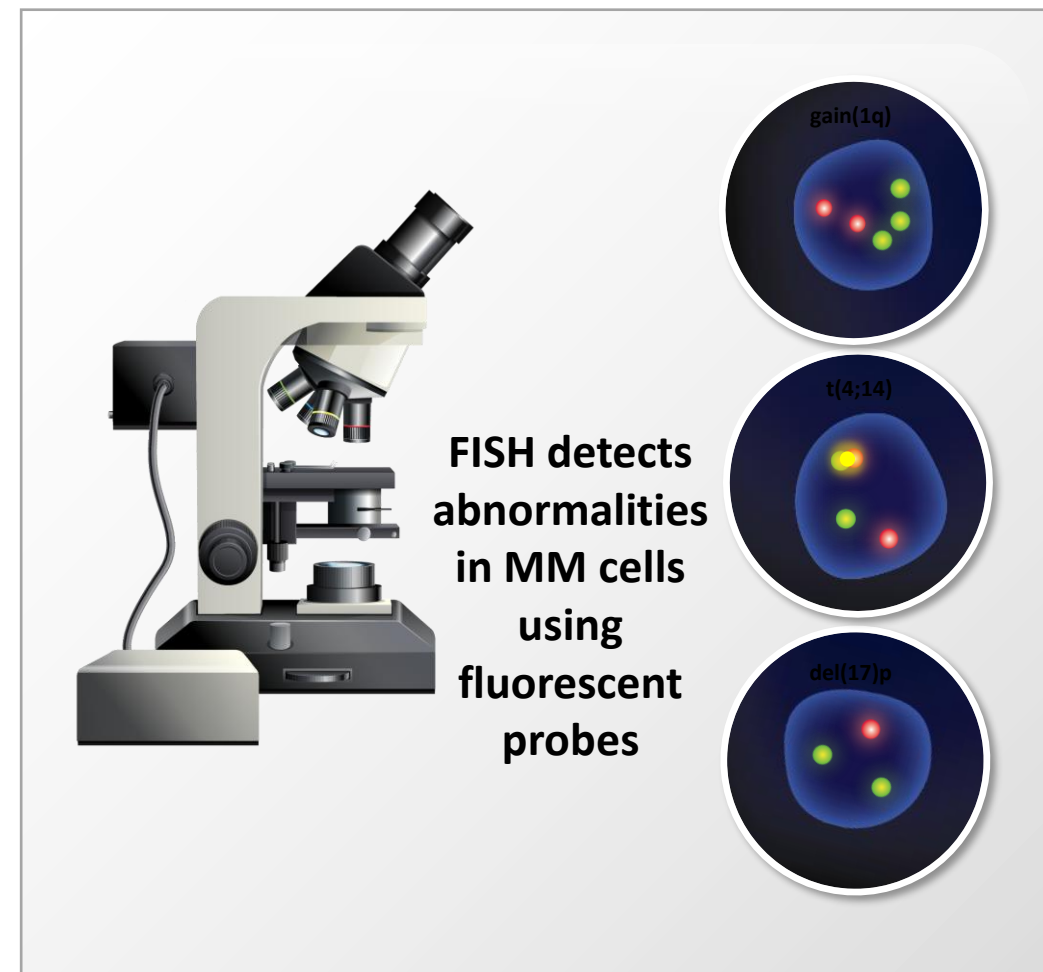
LAB TESTS

- Serum protein electrophoresis (SPEP)
- Immunofixation electrophoresis (IFE)
- Urine protein electrophoresis (UPEP)
- CBC + differential; CMP, including albumin; β 2 microglobulin; and LDH
- Serum-free light chain assay
- Quantitative immunoglobulins

BONE MARROW BIOPSY (with plasma cell enrichment)

- FISH
- Cytogenetics
- Clonal plasma cell percentage
- Congo red for amyloid

IMAGING (next slide)





Imaging for Multiple Myeloma



Image: Gavriatopoulou M, et al. *Blood Cancer J.* 2020;10:93.

SEVERAL OPTIONS FOR BONE IMAGING

Whole Body Low-Dose CT (WBLDCT)

Best for early screening for bone disease

PET-CT

Response assessment: active residual disease

MRI Whole body (WB) or spine + pelvis

Gold standard to assess bone marrow involvement

Skeletal survey is no longer the standard of care in MM
Bone scan (DEXA) for bone density is not for MM

CT = computed tomography; DEXA = dual-energy x-ray absorptiometry; MM = multiple myeloma; MRI = magnetic resonance imaging; PET = positron emission tomography; WB = whole body; WBLDCT = whole-body low-dose computed tomography.

Brigle K, et al. *J Adv Pract Oncol.* 2022;13(suppl 4):7-14. Hillengass J, et al. *Lancet Oncol.* 2019;20(6):e302-e312. Rome SI, et al. *Clin J Oncol Nurs.* 2017;21(5 suppl):47-59. Faiman B. *Clin Lymphoma Myeloma Leuk.* 2014;14:436-440. Dimopoulos M, et al. *Leukemia.* 2009;23(9):1545-1556.



How to Interpret Laboratory Tests

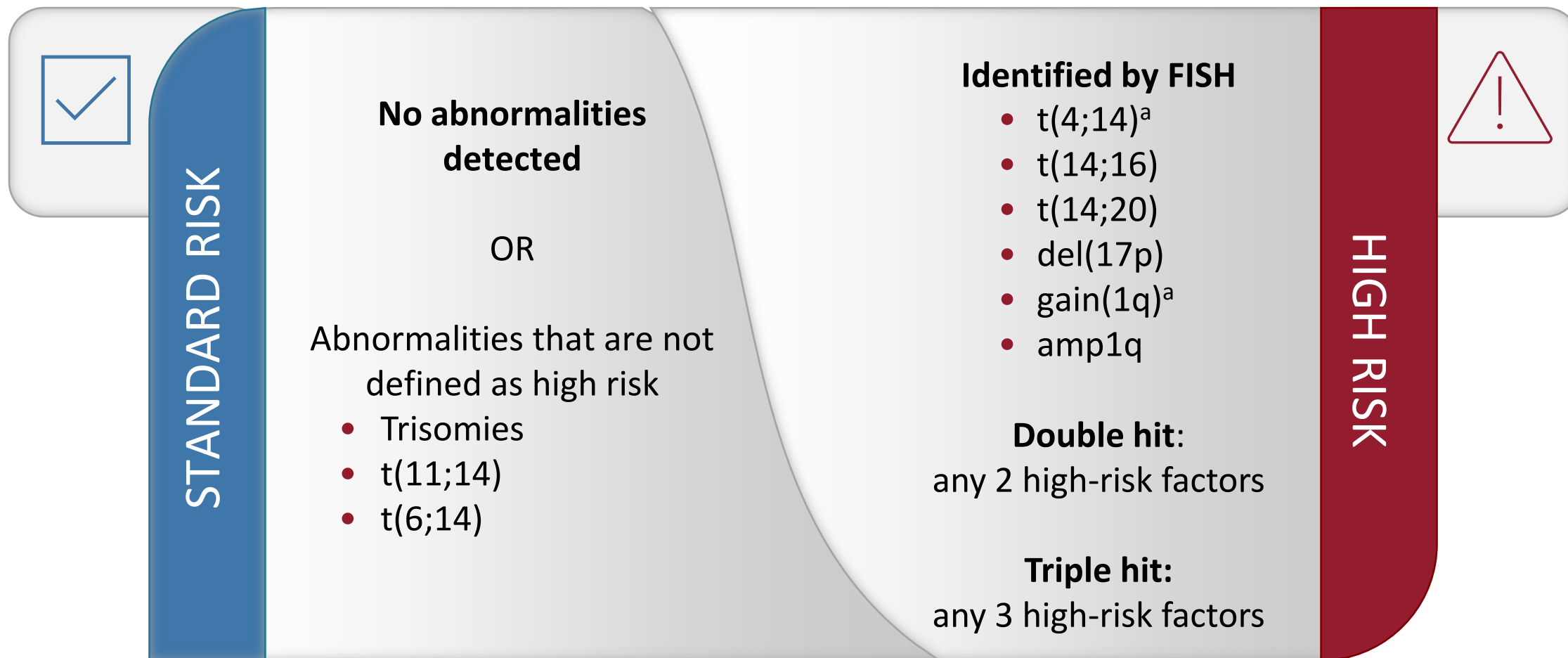
Test	Possible Finding(s) With MM
CBC with differential	↓ Hgb, ↓ WBC, ↓ platelets
CMP and electrolytes	↑ Creatine, ↑ Calcium, ↑ uric acid, ↓ albumin
Serum protein electrophoresis (SPEP) with quantitative immunoglobulins	↑ M protein in serum, may have ↓ levels of normal antibodies
Immunofixation of serum	Identifies light/heavy chain types of M protein
Serum free light chain assay	↑ Involved to uninvolved ratio
B2M and LDH	↑ Levels (measure of tumor burden)
24-hour urine protein electrophoresis (UPEP) with immunofixation	↑ Monoclonal protein (<i>Bence Jones</i>)
BM aspirate and biopsy, FISH, and cytogenetics	≥ 10% clonal plasma cells, prognosis (FISH and cytogenetics) Congo red bone marrow stain if amyloid suspected Clonoseq ID through NGS
Low-dose whole-body CT, PET/CT, or MRI	Osteolytic lesions, osteoporosis, EM disease

B2M = β 2 microglobulin; CBC = complete blood count; CMP = comprehensive metabolic panel; CT = computed tomography; EM = extramedullary; FISH = fluorescence in situ hybridization; Hgb = hemoglobin; LDH = lactate dehydrogenase; M protein = monoclonal protein; MRI = magnetic resonance imaging; NGS = next-generation sequencing; PET = positron emission tomography; WBC = white blood cell.

Faiman B. *Clin Lymphoma Myeloma Leuk*. 2014;14:436-440; Hillengass J, et al. *Lancet Oncol*. 2019;20(6):e302-e312. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to [NCCN.org](https://www.nccn.org).



Risk With Multiple Myeloma



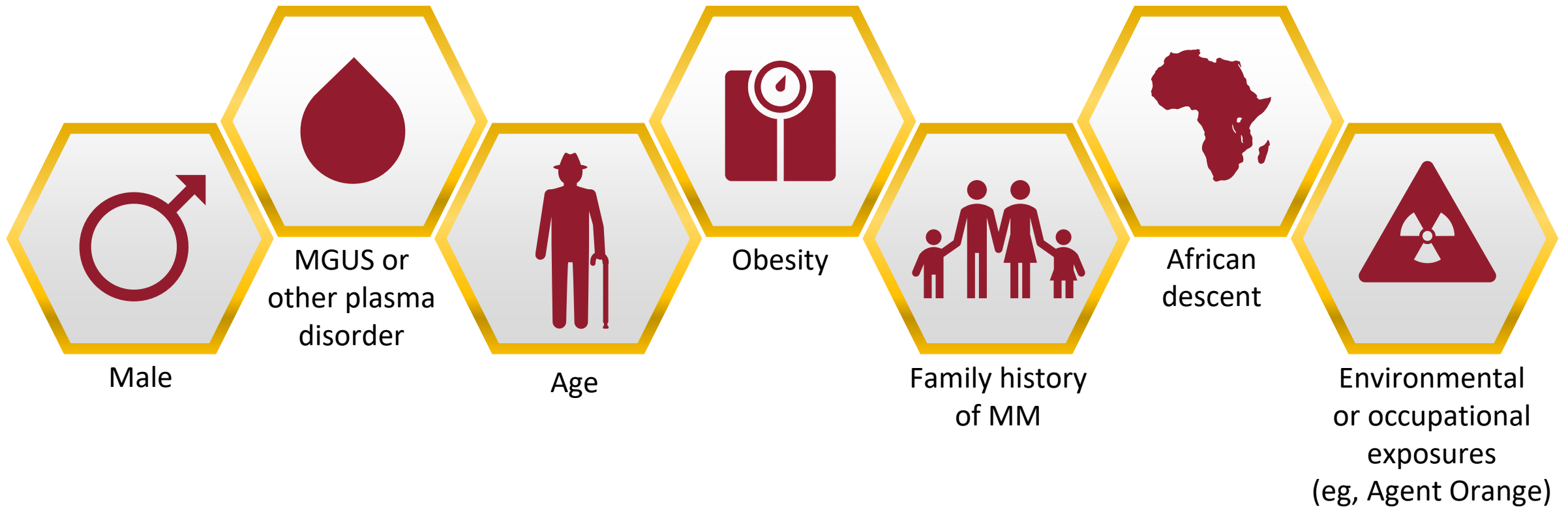
^aHigh risk if detected in SMM; intermediate risk in MM according to Rajkumar SV 2022.

amp = amplification; del = deletion; FISH = fluorescence in situ hybridization; MM = multiple myeloma; SMM = smoldering multiple myeloma; t = translocation.

Rajkumar SV. *Am J Hematol.* 2022;97(8):1086-1107.

Characteristics Put Some People at Higher Risk for MM

RISK FACTORS

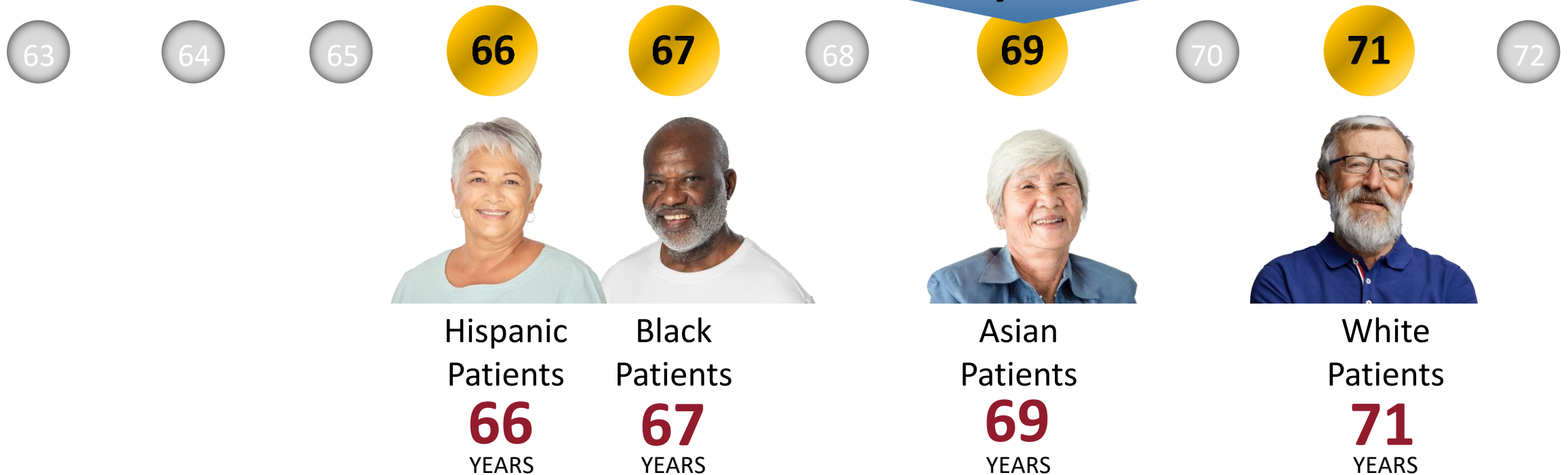


MM = multiple myeloma; MGUS = monoclonal gammopathy of undetermined significance.

Plasma Cell Neoplasms (Including Multiple Myeloma) Treatment (PDQ®)—Patient Version - NCI. Published December 9, 2022. Accessed April 3, 2025. <https://www.cancer.gov/types/myeloma/patient/myeloma-treatment-pdq>. Tariman JD. Multiple myeloma. In: Yarbro CH, Frogge MH, Goodman M, eds. *Cancer Nursing: Principles and Practice*. Jones and Bartlett Publishers; 2005:1460-1489. Sergentanis TN, et al. *Clin Lymphoma Myeloma Leuk*. 2015;15(10):563-577.

Median Age at Diagnosis of MM Varies by Race/Ethnicity

THE MEDIAN AGE AT
DIAGNOSIS FOR
ALL PATIENTS IS
69 years



MM = multiple myeloma.

SEER*Explorer: An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute; 2024 Apr 17. [updated: 2024 Nov 5; cited 2025 Mar 18]. Available from: <https://seer.cancer.gov/statistics-network/explorer/>. Data source(s): SEER Incidence Data, November 2023 Submission (1975-2021), [SEER 22 registries](#). Accessed March 18, 2025.

Health Disparities in Multiple Myeloma

Compared with White patients, Black patients with MM are:

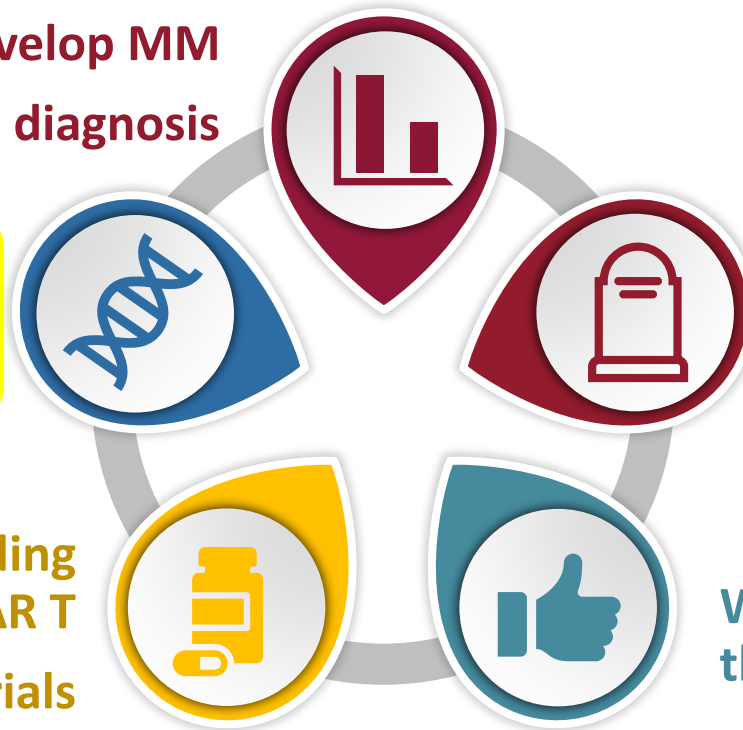
Twice as likely to develop MM

More likely to experience delayed diagnosis

More likely to have lower-risk disease

Less likely to receive life-extending therapies, eg, ASCT, IMiDs, PIs, and CAR T

Underrepresented in clinical trials



Have more than double the mortality

When given equal access to therapies, survival is equal or better

ASCT = autologous stem cell transplant; CAR = chimeric antigen receptor; IMiD = immunomodulatory drug; MM = multiple myeloma; PI = protease inhibitor.

Bhutani M, et al. *J Natl Med Assoc.* 2003;115(2 suppl):S26-S31. Dong J, et al. *Blood Cancer J.* 2022;12(2):34. Pierre A, Williams TH. *Clin J Oncol Nurs.* 2020;24(4):439-443. Greenberg AJ, et al. *Blood Cancer J.* 2015;4:e2713. Baker A, et al. *Blood.* 2013;12(16):3147-3152. Waxman AJ, et al. *Blood.* 2010;116(25):5501-5506. Hari PN, et al. *Biol Blood Marrow Transplant.* 2010;16:395-402. Saraf SL, et al. *Bone Marrow Transplant.* 2013;48:319-320. Rhotagi N, et al. *Am J Clin Oncol.* 2007;30(5):540-548. Ailawadhi S, et al. *Blood Cancer J.* 2018;8(7):67. Ailawadhi S, et al. *Cancer Med.* 2017;6(12):2876-2885. Doroshow D, et al. *Ann Oncol.* 2020;31:S1204. Hultcrantz M, et al. *Blood Cancer Discov.* 2020;1:234-243. Costa LJ, et al. *Biol Blood Marrow Transplant.* 2015;21(4):701-706.

Importance of Participation by Diverse Populations in Clinical Trials



How are researchers improving diversity in clinical trials?

People from racial and ethnic minorities and other diverse groups are underrepresented in clinical research. This is a concern because people of different ages, races, and ethnicities may react differently to medical products.



US Cancer Centers of Excellence Strategies for Increased Inclusion of Racial and Ethnic Minorities in Clinical Trials

What Can Nurses Do to Combat Disparities in MM Care?

STRIVE to become aware of potential conscious or unconscious biases



BE AWARE of higher rates and earlier age of onset of MGUS and MM in Black and Hispanic patients



ENSURE equal access to centers of excellence and treatments (eg, ASCT, IMiDs, PIs, clinical trials) and supportive care

ENGAGE each patient; be aware of cultural differences



ENCOURAGE Black patients with MM to connect with IMF
<https://mpower.myeloma.org/>



AHRQ FREE patient engagement tools: <https://www.ahrq.gov/health-literacy/patient-education/index.html>

AHRQ = Agency for Healthcare Research and Quality; ASCT = autologous stem cell transplant; IMF = International Myeloma Foundation; IMiD = immunomodulatory drug; MGUS = monoclonal gammopathy of undetermined significance; MM = multiple myeloma; PI = protease inhibitor.

Dong J, et al. *Blood Cancer J.* 2022;12(2):34. El-Khoury H, et al. ASH 2021. Abstr #152. Pierre A, Williams TH. *Clin J Oncol Nurs.* 2020;24(4):439-443. Greenberg AJ, et al. *Blood Cancer J.* 2015;4:e2713. Baker A, et al. *Blood.* 2013;12(16):3147-3152. Waxman AJ, et al. *Blood.* 2010;116(25):5501-5506. Hari PN, et al. *Biol Blood Marrow Transplant.* 2010;16:395-402. Saraf SL, et al. *Bone Marrow Transplant.* 2013;48:319-320.

Rhotagi N, et al. *Am J Clin Oncol.* 2007;30(5):540-548. Ailawadhi S, et al. *Br J Haematol.* 2012;158:91-98. Doroshow D, et al. *Ann Oncol.* 2020;31:S1204. Hultcrantz M, et al. *Blood Cancer Discov.* 2020;1:234-243.

International Myeloma Foundation website. Accessed April 3, 2025. <http://www.myeloma.org>.

Engaging Each Patient: Conversation Starters for Nurses (Spanish Language Version Available)



CONVERSATION STARTERS FOR NURSES

As a nurse, YOU have a central role in the patient's experience. The following conversation-starters may help you provide personalized care by considering the patient's unique perspectives and social determinants of health. YOU can enhance trust, open lines of communication, and improve patient outcomes.

- What is your preferred language for communication?
- Is it hard for you to get to the doctor, to work, or to get things you need?
- Do you ever worry about having the things you need, such as food and medicine?
- Based on your past experiences, do you have concerns about going to the doctor?
- Are you comfortable talking to your medical team about your illness and care plan?
- How can we help you feel more comfortable during your medical visits?
- Before diagnosis, did you feel stressed, anxious, or have trouble sleeping? Has that changed?
- Who do you live with?
- Who are the people in your life you might talk to about your diagnosis?



- Do you have someone who can care for you if you need help?
- With everything you do for work or family, what does a typical day look like?
- Are you worried about your medical treatment causing changes to your daily life?
- What else about treatment worries you?
- How much detail would you like to know about your diagnosis and treatment?
- Some people find that a clinical trial gives them more treatment options. Would you like to learn more about clinical trials?

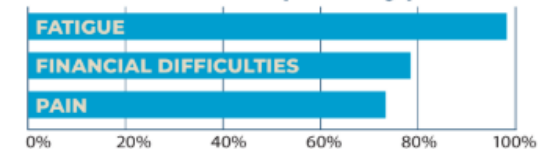


5% of U.S. adults skip healthcare due to transportation barriers
hfma.org



Nearly 33% of Americans lack a Primary Care Provider
nachc.org

Common concerns reported by patients



Prevalence of symptoms in patients with multiple myeloma: a systematic review and meta-analysis. Ramsenthaler C. et al, Eur J Haematol. 2016; 97(5):416-429.

myeloma.org



Knowledge Is Power: Steep Learning Curve for Newly Diagnosed Patients With Multiple Myeloma

- Patient education is crucial but can be overwhelming
- The shock of diagnosis makes understanding and retaining information difficult
 - Tell patients, but also give written or electronic information they can refer to
 - Engage care partners or extended family
 - Focus on crucial information
 - Encourage patients to play an active role in their health and treatment



<https://www.cancer.gov>



<https://www.cancer.org>

IMF Videos



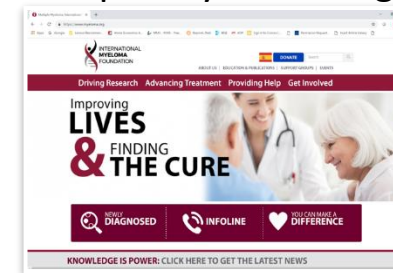
IMF Patient and Family Seminar 2024 — Boca Raton,



Multiple Languages


Free Download or
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IMF Website
<http://myeloma.org>




Leukemia & Lymphoma
Society
<https://www.lls.org>

Myelo, an Ethical AI-Empowered Tool for Myeloma Questions on the IMF Website <http://Myeloma.org>

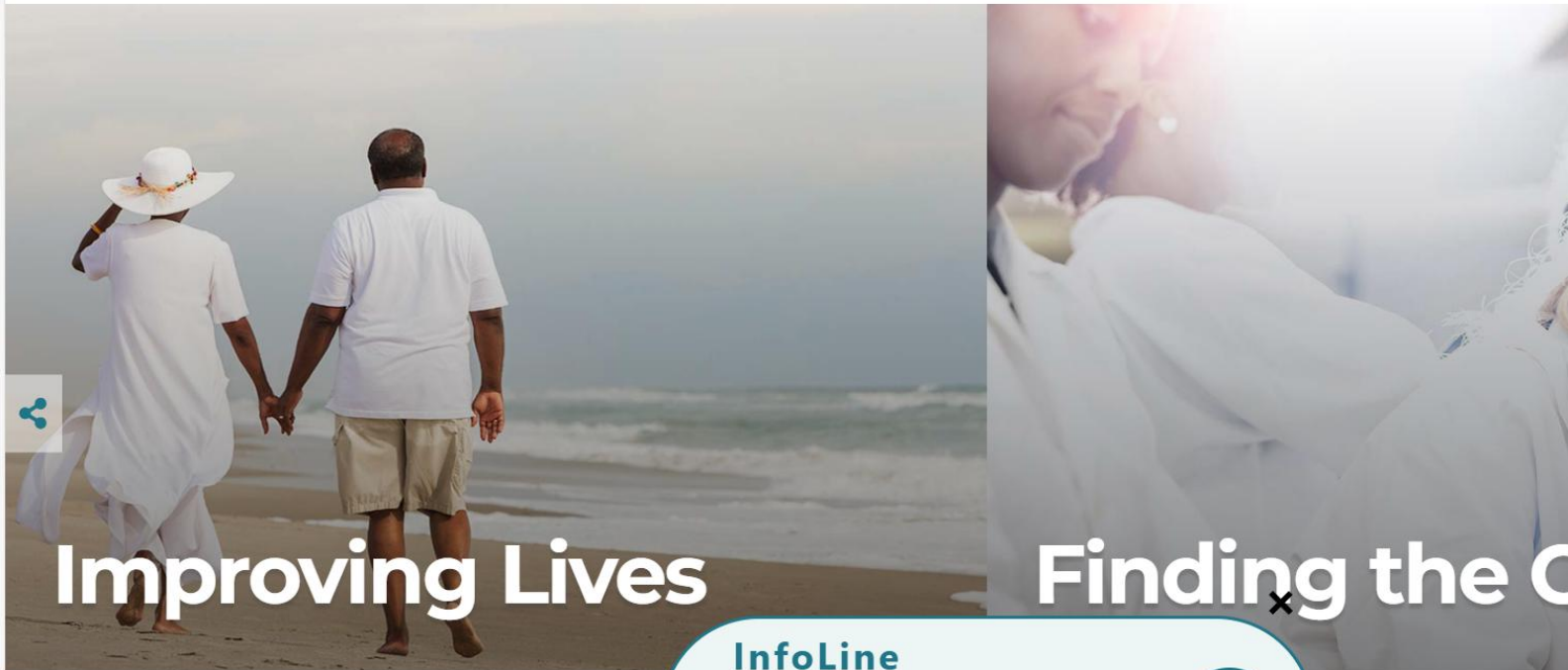
Multiple Myeloma Information | 

[https://www.myeloma.org](#)  


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March 17, 2025

 Hello there! I am Myelo, IMF's new AI powered support chat!

Have questions about Myeloma or IMF? Chat with me to find answers to your queries



Mon 7:41 PM


 Ask me or check out FAQs below.

[What Is Multiple Myeloma?](#)

[What is frontline treatment for active myeloma?](#)

[What is IMF doing to cure myeloma?](#)

Powered by **MAX.AI**  ZS

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How can I help you today?



Is there still a role for autologous stem cell transplant?

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Is there still a role for autologous stem cell transplant?

Fri 1:17 PM



Yes, autologous stem cell transplant (ASCT) still plays an important role in the treatment of multiple myeloma. Here are some key points about the current role of ASCT:

- Standard of Care: ASCT remains the standard of care for fit multiple myeloma patients. It can provide deep responses and long-term remissions.
- Deep Response: ASCT can help achieve minimal residual disease (MRD) negativity, which is associated with improved outcomes and survival.



Type your question here



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Hi! I am Myelo

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Why is maintenance therapy important?

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Why is maintenance therapy important?

Fri 1:35 PM



Maintenance therapy is important in multiple myeloma treatment for several key reasons:

- Extended Remission: It helps extend the time the disease remains in remission after initial treatment.
- Improved Survival: Maintenance therapy may improve overall survival for myeloma patients.
- Deep Response: It can help maintain and potentially deepen the response achieved with initial therapy.
- Disease Control: Maintenance therapy helps keep the myeloma under control for longer



Type your question here



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Important Health Protection Education for Patients With MM



How can the risk of kidney damage be minimized in patients with MM?

INFECTION PREVENTION

- Ensure handwashing, hygiene
- Growth factor (eg, filgrastim)
- IVIG for hypogammaglobulinemia
- Immunizations (NO live vaccines)
 - RSV vaccine
 - Shingles vaccine: zoster vaccine recombinant, adjuvanted
 - COVID-19 vaccination + booster(s)
 - Pneumococcal 20-valent conjugate vaccine
 - Seasonal inactivated influenza vaccine (× 2 or high dose)
- Avoid contact with sick people



KIDNEY HEALTH

Risks

- Active MM (M protein, casts)
- High calcium

Prevention

- Avoid certain medications (contrast dyes, NSAIDs)
- Hydration

Treatment

- Address underlying myeloma causing kidney dysfunction
- Dose adjustments may be needed for reduced kidney function



BONE HEALTH

- Hypercalcemia from bone destruction can affect the kidneys
- ≈ 85% of patients with MM develop bone disease

Monitor

- Report new or worsening bone pain

Medical testing or intervention

- Monitor serum calcium levels
- Imaging may be needed depending on type and location of pain (eg, MRI, PET/CT)
- Bone-modifying agents



CT = computed tomography; IVIG = intravenous immunoglobulin; M protein = monoclonal protein; MM = multiple myeloma; MRI = magnetic resonance imaging; NSAID = nonsteroidal anti-inflammatory drug;

PET = positron emission tomography; RSV = respiratory syncytial virus.

Brigle K, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):7-14. Hillengass J, et al. *Lancet Oncol*. 2019;20(6):e302-e312. Faiman B, et al. *Clin J Oncol Nurs*. 2017;21(5 suppl):19-36. Faiman B, et al. *Clin J Oncol Nurs*.

2011;15(suppl):66-76. Miceli TS, et al. *Clin J Oncol Nurs*. 2011;15(4):9-23. Rome SI, et al. *Clin J Oncol Nurs*. 2017;21(5 suppl):47-59. Dimopoulos M, et al. *Leukemia*. 2009;23(9):1545-1556. Brigle K, et al. *Clin J*

Oncol Nurs. 2017;21(5 suppl):60-76.

Bone-Modifying Agents



Recommendation: Bone-strengthening agents should be administered for at least 12 months to all patients with newly diagnosed MM, with or without bone disease

Agent	Notes
Zoledronic Acid	<ul style="list-style-type: none">• Preferred agent• Also indicated for MM-related hypercalcemia• PFS and OS benefit
Denosumab	<ul style="list-style-type: none">• May also be used, particularly in patients with kidney impairment• May prolong PFS in patients who are newly diagnosed with MM and are ASCT-eligible• Discontinuation can be challenging due to rebound effect
Pamidronic Acid	<ul style="list-style-type: none">• May be used if other agents are not available

CASE 1

ANNE*

PATIENT NOTES:

- Felt overwhelmed by cancer diagnosis
- Concerned about costs, impact on family
- Concerned about treatment and side effects
- Concerned about long-term survival



*HIPAA-compliant,
not actual patient
name, stock photo.

Treatment of Newly Diagnosed Myeloma



INDUCTION

Initial treatments aimed at reducing the amount of myeloma cells

CONSOLIDATION

Intensification of treatment to deepen response. Either additional cycles of induction or autologous stem cell transplant

MAINTENANCE

Prolonged lower-intensity treatment designed to sustain remission

Induction Standard of Care: Frontline Quadruplet

QUADRUPLLET THERAPY is preferred for nearly all patients newly diagnosed with myeloma

Anti-CD38 monoclonal antibody (mAb)

- Daratumumab OR
- Isatuximab



Proteasome inhibitor (PI)

- Bortezomib OR
- Carfilzomib



Immunomodulatory drug (IMiD)

- Lenalidomide OR
- Thalidomide



Steroid

- Dexamethasone

At infusion clinic

Subcutaneous injection or intravenous infusion

Oral medication taken at home by patient

Adherence considerations

Supportive medication:

- **Antiviral prophylaxis** (eg, acyclovir or valacyclovir) to prevent viral infections, particularly shingles
- **Aspirin or other anticoagulant therapy** to reduce the risk of blood clots from IMiDs or carfilzomib
- **Bone-strengthening agents** (eg, zoledronic acid, denosumab) to strengthen bones and protect against fractures



Key Quadruplet Trials in Transplant-Eligible NDMM

Higher MRD negative rates with quadruplet regimens compared with triplets in NDMM

Outcome	PERSEUS ^{1,2}		IsKia ³		CASSIOPEIA ⁴		GMMG-HD7 ⁵	
	D-VRd (n = 355)	VRd (n = 354)	Isa-KRd (n = 151)	KRd (n = 151)	D-VTd/D (n = 229)	VTd/Obs (n = 215)	Isa-VRd (n = 331)	VRd (n = 329)
PFS	<u>4-year PFS, %</u> 84.3 (HR 0.42, <i>P</i> < 0.0001)		<u>1-year PFS, %</u> 95 (<i>P</i> < 0.049)		<u>6-year PFS, %</u> 60.3 20.8 –		–	–
≥ CR, %	87.9 (<i>P</i> < 0.0001)	70.1	74 (<i>P</i> < 0.001)	72	76.4 –	49.3	45.3 (<i>P</i> = 0.013)	34.0
MRD negativity, %								
10 ⁻⁵								
Post consolidation	57.5	32.5	77	67	63.7	43.7	66.2	47.7
Overall	75.2	47.5	–	–	77.3	51.2	–	–
10 ⁻⁶								
Post consolidation	34.4	16.1	67	48	–60.7	–30.7	–	–
Overall	65.1	32.2	–	–			–	–

D = daratumumab; CR = complete response; Isa = isatuximab; HR = hazard ratio; KRd = carfilzomib, lenalidomide, dexamethasone; MRD = minimal residual disease; NDMM = newly diagnosed multiple myeloma; Obs = observation; PFS = progression-free survival; Rd = revlimid, dexamethasone; VRd = bortezomib, lenalidomide, dexamethasone; VTd = bortezomib, thalidomide, dexamethasone.

1. Supplement to Sonneveld P, et al. *N Engl J Med*. 2024;390(4):301-313. 2. Rodriguez-Otero P, et al. ASCO 2024. Abstr #7502. 3. Gay F, et al. *Blood*. 2023;142(suppl 1):LBA4. 4. Corre J, et al. IMS 2024. Abstr #OA-47. 5. Raab M, et al. EHA 2024. Abstr #S202.



Key Quadruplet Trials in Transplant-Ineligible NDMM

Higher MRD negative rates with quadruplet regimens compared with triplets in NDMM

Outcome	BENEFIT ¹		IMROZ ²		CEPHEUS ³		IFM2017-03 ⁴	
	Isa-VRd (n = 135)	Isa-Rd (n = 135)	Isa-VRd (n = 265)	VRd (n = 181)	D-VRd (n = 197)	VRd (n = 198)	DR (n = 200)	Rd (n = 95)
PFS, mo	<u>2-year PFS,^a %</u>		<u>60-mo follow-up</u>		<u>54-mo follow-up</u>		<u>40-mo follow-up</u>	
	85.2%	80.0%	NR	54.3	NR	52.6	48.5	21.5
	–		(HR 0.596, <i>P</i> = 0.0005)		(HR 0.57, <i>P</i> = 0.0005)		(HR 0.51, <i>P</i> = 0.0001)	
OS, mo	<u>2-year OS,^a %</u>						<u>40-mo follow-up</u>	
	91.1%	91.3%	–	–	–	–	NR	36
	–						(HR 0.46, <i>P</i> = 0.0001)	
≥ CR, %	58	31	74.7	64.1	81.2	61.6	17	10
	<i>(P</i> < 0.001)		<i>(P</i> = 0.01)		<i>(P</i> < 0.0001)		–	
MRD negativity, %								
10 ^{−5}	53	26	55.5	40.9	60.9	39.4	10	3
10 ^{−6}	36	17	–	–	46.2	27.3	–	–

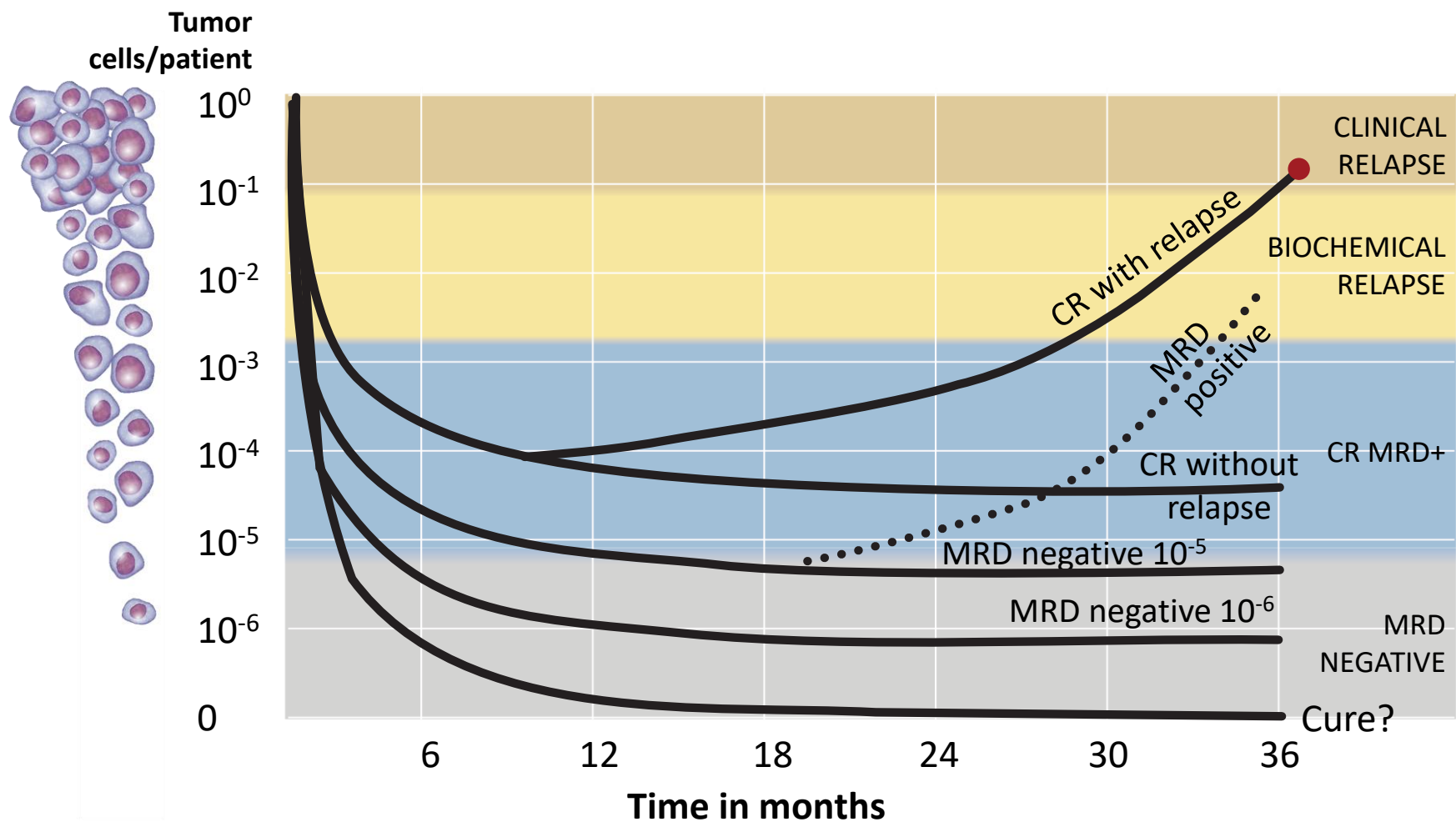
^aEstimated value; data immature.

D = daratumumab; DR = daratumumab, lenalidomide; CR = complete response; HR = hazard ratio; Isa = isatuximab; MRD = minimal residual disease; NDMM = newly diagnosed multiple myeloma; NR = not reached; OS = overall survival; PFS = progression-free survival; Rd = revlimid, dexamethasone; VRd = bortezomib, lenalidomide, dexamethasone.

1. Leleu X, et al. ASCO 2024. Abstr #7501. 2. Facon T, et al. ASCO 2024. Abstr #7500. 3. Usmani S. IMS 2024. Abstr #OA-63. 4. Manier S, et al. ASH 2024. Abstr #744.



No Detectable MRD Is Predictive of Better Outcomes



● Clinical progression



International Myeloma Foundation Achieved MRD Acceptance as a Clinical Trial Endpoint

On 4/12/2024, NGS MRD recognized as an accelerated approval endpoint in clinical trials

Based on efforts from the I2TEAMM



Apr 13, 2024, 03:43

FDA ODAC voted 12-0. Historic victory in multiple myeloma

FDA = US Food and Drug Administration; MRD = minimal residual disease; NGS = next-generation sequencing; ODAC = Oncologic Drugs Advisory Committee.

Historic turning point in myeloma: ODAC unanimously votes in favor of MRD testing. News release. IMF; September 5, 2024. Accessed April 3, 2025. <https://www.myeloma.org/news-events/multiple-myeloma-news/historic-turning-point-myeloma-odac-unanimously-votes-favor-mrd-testing>.



Daratumumab: Anti-CD38 Monoclonal Antibody

Dosing

- Original IV dosing and SC formulation

Safety

- IRR with IV: ≈ 50% (mostly grade 1 and 2, in first or second infusion)
- IRR with SC: ≈ 9%; systemic reactions 10%

Clinical Pearls

- SC dose form for SC only; IV for IV only
- Antibody interference—type and cross BEFORE starting
- Premeds: corticosteroids, antipyretics, antihistamine, and montelukast
- Herpes prophylaxis with acyclovir
- Screen for hepatitis titers; if Hepatitis B core antibody prophylaxis with entecavir
- Hypogammaglobulinemia, infection risk
- Remember appropriate prophylaxis for combination partner drugs

FDA approved
July 2024

D-VRd
(First-line transplant eligible)

D-Rd, D-VMP
(First-line non-transplant)

D-VTd
(First-line transplant eligible)

D-Vd, D-Pd, D-Kd
(1-3 prior therapies)

D monotherapy
(3 prior therapies or
refractory to PI and IMiD)

D = daratumumab; FDA = US Food and Drug Administration; Kd = carfilzomib, dexamethasone; IMiD = immunomodulatory drug; IRR = infusion-related reaction; IV = intravenous; MM = multiple myeloma; Pd = pomalidomide, dexamethasone; PI = proteasome inhibitor; Rd = lenalidomide, dexamethasone; SC = subcutaneous; Vd = bortezomib, dexamethasone; VMP = bortezomib, melphalan, prednisone; VRd = bortezomib, lenalidomide; dexamethasone; VTd = bortezomib, thalidomide, dexamethasone.

DARZALEX® (daratumumab) Prescribing Information. DARZALEX FASPRO® (daratumumab and hyaluronidase-fihj) Prescribing Information. Gleason C, et al. *J Adv Pract Oncol*. 2016;7(suppl 1):53-57.



Isatuximab: Anti-CD38 Monoclonal Antibody

Dosing

- Slower first and second infusions
- Weekly for 4 weeks then every 2 weeks
- Discontinue if IRR grade ≥ 3

Safety

- IRR (38%): the most-common AR specific to isatuximab
- Isa-Pd common ARs: cytopenias, IRR, infections, dyspnea, GI ARs

Clinical Pearls

- Antibody interference—type and cross BEFORE starting
- IRR protection: premedicate with
 - Dexamethasone: 40 mg oral or IV (or 20 mg for patients aged ≥ 75 years)
 - Acetaminophen: 650 mg to 1000 mg
 - H2 antagonists
 - Diphenhydramine: 25 mg to 50 mg oral or IV; IV preferred for at least the first 4 infusions
- Prophylaxis for herpesvirus and DVT
- No dose adjustments for isatuximab

FDA approved
Sept 2024

Isa-VRd
(First-line transplant ineligible)

Isa-Kd
(1-3 prior therapies)

Isa-Pd
(≥ 2 prior therapies: IMiD and PI)

WEEKS 1-4



WEEKLY
(4 doses)

Then ongoing



EVERY 2
WEEKS



Isatuximab On-Body Device Met Coprimary Endpoints in IRAKLIA Phase 3 Study



WATCH FOR

FDA approval of isatuximab delivered via on-body device

Image from Rahman O, et al. *ONdrugDelivery*. 2025;164:28-31.

FDA = US Food and Drug Administration.

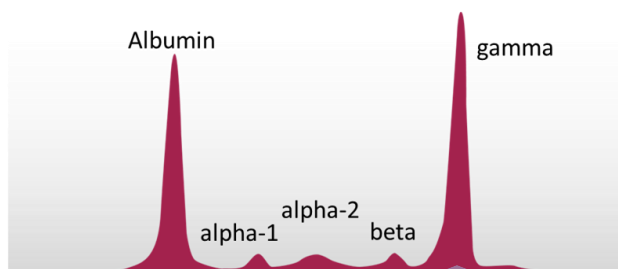
Rahman O, et al. *ONdrugDelivery*. 2025;164:28-31. Desai M, et al. *Drug Deliv*. 2025 Dec;32(1):2484278. Sava J. Targeted Oncology. January 10, 2025. Accessed April 9, 2025. [Subcutaneous Isatuximab Combo Hits](#)

[Primary End Points in Phase 3 Trial](#)



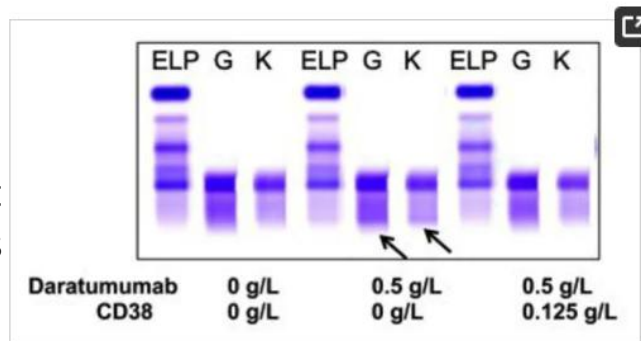
Special Considerations With Antibody Therapy

Interference with IFE laboratory tests



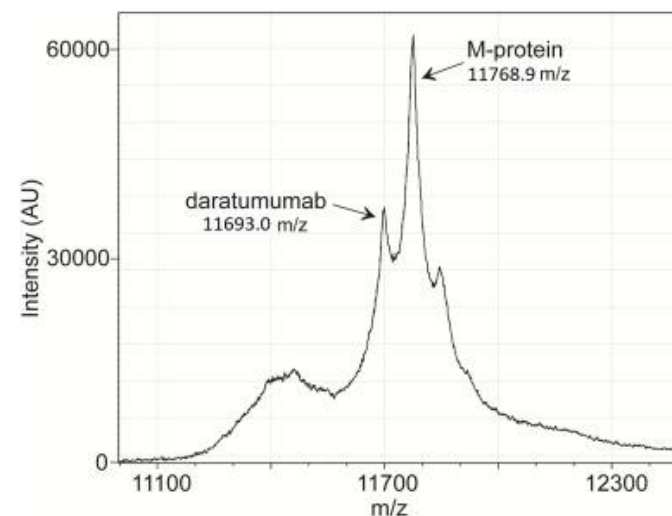
Daratumumab, isatuximab, and elotuzumab are IgG antibodies that co-migrate with IgG M protein

IFE cannot distinguish between therapeutic IgG antibodies and IgG M protein; lowers apparent CR rates



Mass spectrometry (available in some centers) can resolve antibody interference

- Patients with MM can be followed by MS → replacing SPEP and IFE



- MS also has a role in amyloidosis (eg, it has improved accuracy for typing amyloid plaques and has led to the discovery of new types of amyloid)



Maintenance Therapy Nursing Implications



WATCH FOR

New maintenance options,
including clinical trials

- Patients on therapy for a long time: AE management, adherence, treatment fatigue, no pregnancy with lenalidomide
 - Most common reasons for early discontinuation AEs (56%), patient preference (23%)
- May encounter reimbursement challenges with maintenance therapy (begin authorization early, follow up)
- Short-term vs long-term effects
 - Many AEs subside after the first few months
 - Diarrhea with long-term lenalidomide
 - Health screening related to long-term use
- Patients living longer: survivorship care, coordination with PCP, emphasis on healthy behaviors
- Patient advocacy: understanding patient's changing needs/desires; advocating with extended health care team

**Standard
of care**

Lenalidomide maintenance:
10 or 15 mg on
days 1 to 28 of a 28-day cycle

**Two-drug combinations
recommended for high-risk:**
Lenalidomide + carfilzomib
Lenalidomide + daratumumab
Lenalidomide + bortezomib

**Many other regimens in
clinical trial**

AE = adverse event; PI = proteasome inhibitor; PCP = primary care provider.

Bilotti E, et al. *Clin J Oncol Nurs*. 2011;15(4 suppl):25-40. Dimopoulos MA, et al. *Lancet*. 2019;393(10168):253-264. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to [NCCN.org](https://www.nccn.org). Zhang S, et al. *Blood Cancer J*. 2020;10:33. Rajkumar SV. *Am J Hematol*. 2022;97(8):1086-1107. Nunnelee J, et al. *J Clin Med*. 2022;11(19): 5794.

SHARE Approach to Shared Decision-Making



Benefits to Healthcare Professionals

- Improved quality of care delivered
- Increased patient satisfaction

Benefits to Patients

- Improved patient experience of care
- Improved patient adherence to treatment recommendations using the SHARE Approach builds a trusting and lasting relationship between healthcare professionals and patients



FREE Professional Education and Training

<https://www.ahrq.gov/health-literacy/professional-training/index.html>

CASE 1

ANNE*

- Shared decision-making:
 - Treatment goals discussion
 - Explore treatment options:
 - Clinical trial options
 - Treatment risk vs benefit
 - Side effects
 - Priorities and preferences
 - Agree on a treatment plan



MYELOMA TREATMENT DISCUSSION TOOL

This tool was developed in collaboration with myeloma patients and caregivers, leaders of myeloma support groups, and the IMF Nurse Leadership Board. Discuss this tool with your treatment team and healthcare providers.

My preferences when making treatment decisions: (circle YES or NO)

YES NO	It is important for me to understand my treatment plan.
YES NO	I prefer the most aggressive approach to treat my cancer.
YES NO	I prefer to receive treatment in an outpatient setting.
YES NO	I prefer to take medications at home.
YES NO	I prefer to take the least possible amount of pills to control my cancer.
YES NO	I am willing to endure as many side effects as necessary to control my cancer.
YES NO	Quality of life is more important to me than quantity of life.
YES NO	Clinical trial participation is of interest to me.
YES NO	My out-of-pocket cost of treatment is important to me.
YES NO	I prefer to continue an active lifestyle during my cancer treatment.
YES NO	I worry about how my treatment will affect my future treatment options.

B. Fairman, T. King, K. Noonan, C. Marchenko, C. Gleason, J.D. Tariman, and the IMF Nurse Leadership Board. "Development of a Participatory Patient Decision Aid for Patients with Multiple Myeloma." International Myeloma Workshop 2019.



*HIPAA-compliant, not actual patient name, stock photo.

CASE 1

ANNE*	
TREATMENT	Quadruplet: anti-CD38 VRd Shared decision-making
ASCT	Referral for consult with transplant center
MAINTENANCE	Planned: R or clinical trial

Remember:

- ✓ Shingles prevention
- ✓ DVT prophylaxis
- ✓ Monitor sugars



*HIPAA-compliant,
not actual patient
name, stock photo.

How Well Treatment Is Working: IMWG Myeloma Response and Relapse Criteria Assessment

CR	CR: M protein undetectable in serum or urine (negative immunofixation); no more than 5% plasma cells in bone marrow; no new lytic lesions; plasmacytomas resolved	Further categorization of CR: sCR (FLC ratio normal), MRD negative
VGPR	> 90% reduction in serum M protein and urine M protein < 100 mg/24h	
PR	> 50% reduction in serum M protein AND >90% reduction in urine M protein to < 200 mg/24h ^a	
MR		
SD		
PD		

For nurses:

- ✓ Order labs regularly
- ✓ Encourage patients to know who is monitoring
- ✓ Tell patient whom to alert if something is not happening the usual way
- ✓ Monitor for relapse:
 - CRAB symptoms OR increase of 25% in M protein from the lowest point

^aIf serum and urine M protein are not measurable, a > 50% decrease in the difference between involved and uninvolved FLC levels in place of the M protein criteria.

CR = complete response; CRAB = calcium elevation, renal dysfunction, anemia, bone lesions; FLC = free light chain; h = hour; IMWG = International Myeloma Working Group; M protein = monoclonal protein; MR = minimal response (only in relapsed); MRD = minimal residual disease; PD = progressive disease; PR = partial response; sCR = stringent complete response; SD = stable disease; VGPR = very good partial response.

Xu T, et al. PLOS ONE. 2025;18(5):e0285125. Palumbo A, et al; International Myeloma Working Group. *J Clin Oncol*. 2014;32:587-600. Durie BM, et al; International Myeloma Working Group. *Leukemia*.

2006;20(9):14671473. Kumar S, et al. *Lancet Oncol*. 2016;17(8):e328-e346.

Example MRD Test Results

What guidelines do you use to order MRD testing for patients?



The IMWG recognizes that this is a need and is working on a MRD guideline.

NCCN Guideline v1.2025 for Multiple Myeloma says “Consider MRD testing as indicated for prognostication after shared decision with patient” per follow-up/surveillance (MYEL-4) and have MRD response criteria (MYEL-E), including footnote a, which says, “...information on MRD after each treatment stage is recommended (eg, after induction, high-dose therapy/autologous stem cell transplants (ASCT), consolidation, maintenance). MRD tests should be initiated only at the time of suspected complete response.”

ASTC = autologous stem cell transplant; IMWG = International Myeloma Working Group; MRD = minimal residual disease; NCCN = National Comprehensive Cancer Network.



Residual Sequences Detected

ESTIMATED MRD VALUE:

14 residual clonal cells per million nucleated cells (Range: >0 - 25)

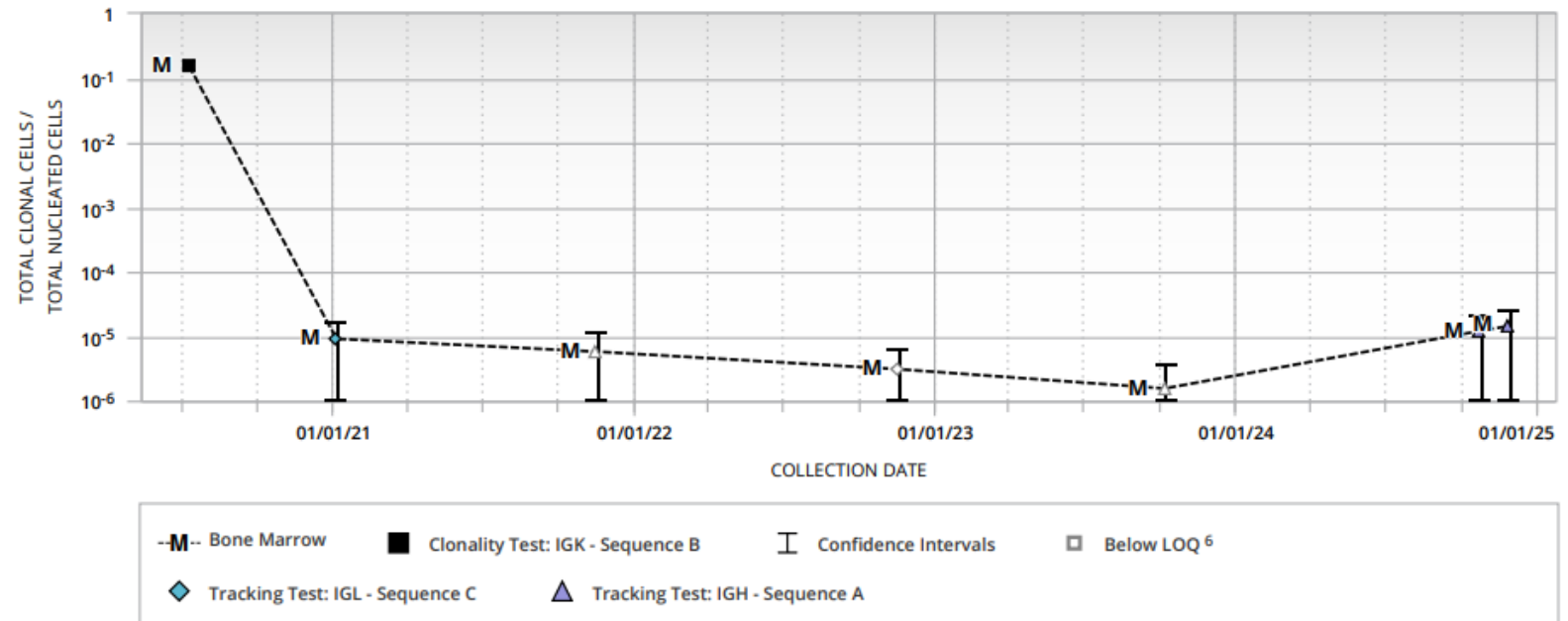
Total nucleated cells evaluated from this sample: 1,155,745

The MRD range presented above represents the 95% confidence interval for the measured number of residual clonal sequences per million nucleated cells. Details for each identified dominant sequence from this sample are provided on subsequent pages of this report.

RESULTS SUMMARY

- Genomic DNA was extracted from a fresh bone marrow sample.
 - 3 of the 3 dominant sequences identified in a diagnostic sample from this patient were still present in this current sample.
 - 17 copies of the dominant sequence determining the MRD result (IGH Sequence A) were observed out of 1,155,745 total nucleated cells evaluated from this sample.
- **The results obtained from this assay should always be used in combination with the clinical examination, patient medical history, and other findings.**

SAMPLE-LEVEL MRD TRACKING (shows only the sequence determining the MRD result for each time point)



The number of clonal cells may vary by sample type. As such, changes in clonal cell values over time are best compared using the same sample type, indicated by connecting lines.



Consider Frailty of Patients With MM and Individualize Care

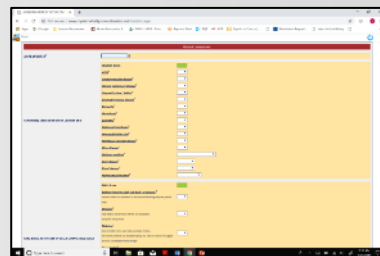
Fitness evaluation



Adapted treatment

Online myeloma frailty score calculator at

<http://www.myelomafrailtyscorecalculator.net/>

Frailty score based on age, comorbidities, and ability to manage daily activities



Score	Patients, %	3-Year Survival, %	Treatment Discontinuation, %
 0 (Fit)	39	84	17
1 (Intermediate)	31	76	22
 ≥ 2 (Frail)	31	57	25



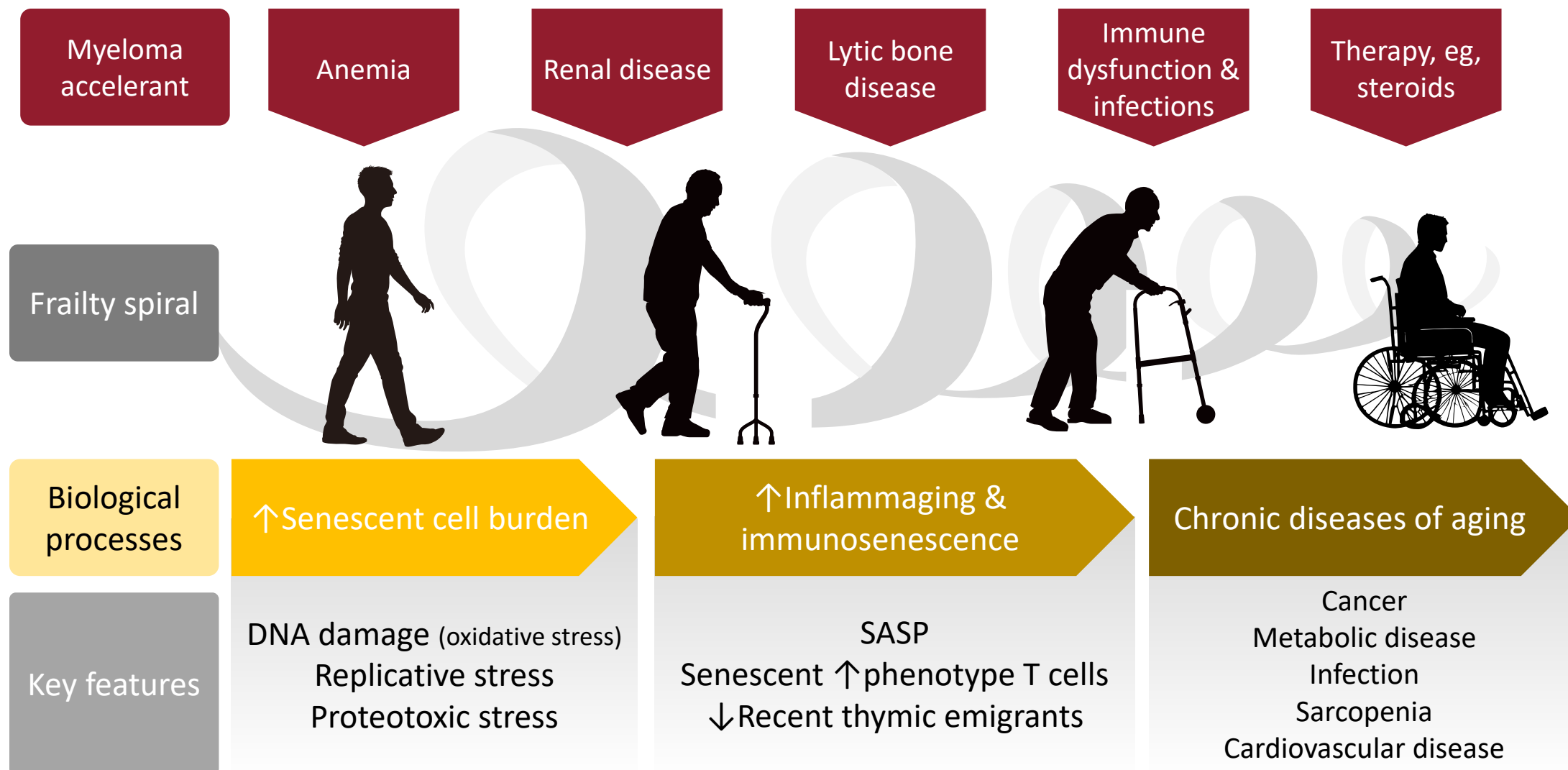
- Consider the appropriateness of ASCT
- Consider dose adjustments for tolerability
 - Bortezomib: only use weekly with subcutaneous administration
 - Lenalidomide: consider lower dose, 5, 10, or 15 mg
 - Dexamethasone: start at 20 instead of 40 mg and taper rapidly
- Reduced intensity frontline: anti-CD38 mAb-containing regimens or RVD-lite
- **Proactive AE management to avoid disability and downward spiral**

AE = adverse event; ASCT = autologous stem cell transplant; mAb = monoclonal antibody; MM = multiple myeloma; RVD = lenalidomide, bortezomib, dexamethasone.

Grant SJ, et al. *Hematology Am Soc Hematol Educ Program* (2021). 2021(1):46-54. O'Donnell EK, et al. *Br J Haematol*. 2018;182(2):222-230. Palumbo A, et al. *Blood*. 2015;125(13):2068-2074. International Myeloma Working Group. Myeloma Frailty Score Calculator. Accessed April 4, 2025. <http://www.myelomafrailtyscorecalculator.net/>. Dr. Joseph Mikhael personal communication.



Frailty Spiral: MM May Accelerate Age-Related Physiological Decompensation



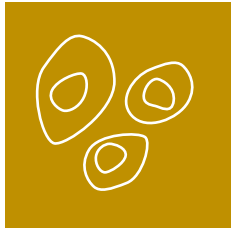
Survivorship Care Plans Are Important and Recommended for Each Survivor



National Academy of Medicine Recommendation: A Survivorship Care Plan for Each Survivor

- **Record of care**
 - Diagnosis, including diagnostic tests and results
 - Treatments received, total dosage, responses, toxicities
 - Other supportive services (psychosocial, etc)
 - Contact information for key providers
 - Point of contact for continuing care
- **Follow-up plan**
 - Ongoing health maintenance therapy/testing
 - Recommended screenings
 - Late/Long-term effects of treatments
 - Recommendations/Resources for healthy behaviors, support, etc

Summary



MM is a cancer of the plasma cells. Active MM, defined by **CRAB criteria** and/or myeloma-defining events (**SLiM**), requires treatment. **MGUS and SMM are premalignant conditions** associated with MM.



Frontline quadruplet regimens containing an anti-CD38 antibody, PI, IMiD, and steroid produce deep responses and are the standard of care.



The **workup for MM** includes laboratory blood work, genetic testing (bone marrow biopsy), and imaging for bone involvement.



Maintenance therapy is recommended for patients with MM following the induction regimen. Lenalidomide for most; IMiD + PI for high risk



Disparities exist among patients with MM. Black patients tend to have lower-risk disease and can achieve superior outcomes when treated with standard of care. Nurses are important to reducing disparities.



Nurses can support shared decision-making by using the SHARE model and encouraging patients to discuss their priorities and preferences with the healthcare team.

CRAB = calcium elevation, renal dysfunction, anemia, bone lesions; MGUS = monoclonal gammopathy of undetermined significance; MM = multiple myeloma; SLiM = PC \geq 60%, light chain, MRI; SMM = smoldering multiple myeloma.

Kyle RA, et al. *Mayo Clin Proc.* 2003;78:21-33. Greenberg AJ, et al. *Blood Cancer J.* 2015;4:e271. Baker A, et al. *Blood.* 2013;12(16):3147-3152. Brigle K, et al. *J Adv Pract Oncol.* 2022;13(suppl 4):7-14. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to NCCN.org. O'Donnell EK, et al. *Blood.* 2019;134(suppl 1):3178. Pierre A, Williams TH. *Clin J Oncol Nurs.* 2020;24(4):439-443. O'Donnell EK, et al. *Br J Haematol.* 2018;182(2):222-230. Gerber L. *Nursing.* 2018;48(4):55-58. The SHARE approach. Agency for Healthcare Research and Quality website. Accessed April 5, 2025. <https://www.ahrq.gov/health-literacy/professional-training/shared-decision/index.html>.

International Myeloma Foundation
800-452-CURE (2873)
<http://myeloma.org>

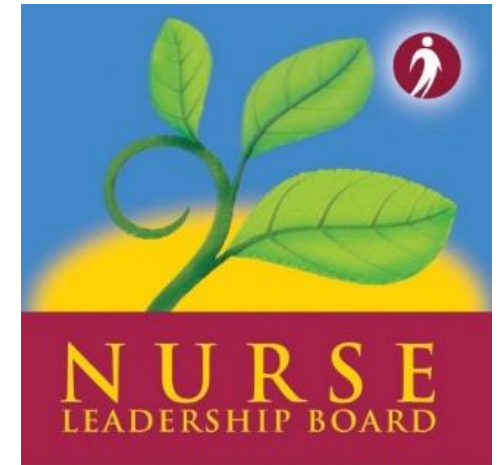
Relapsed Multiple Myeloma

CASE 2: MARCUS*

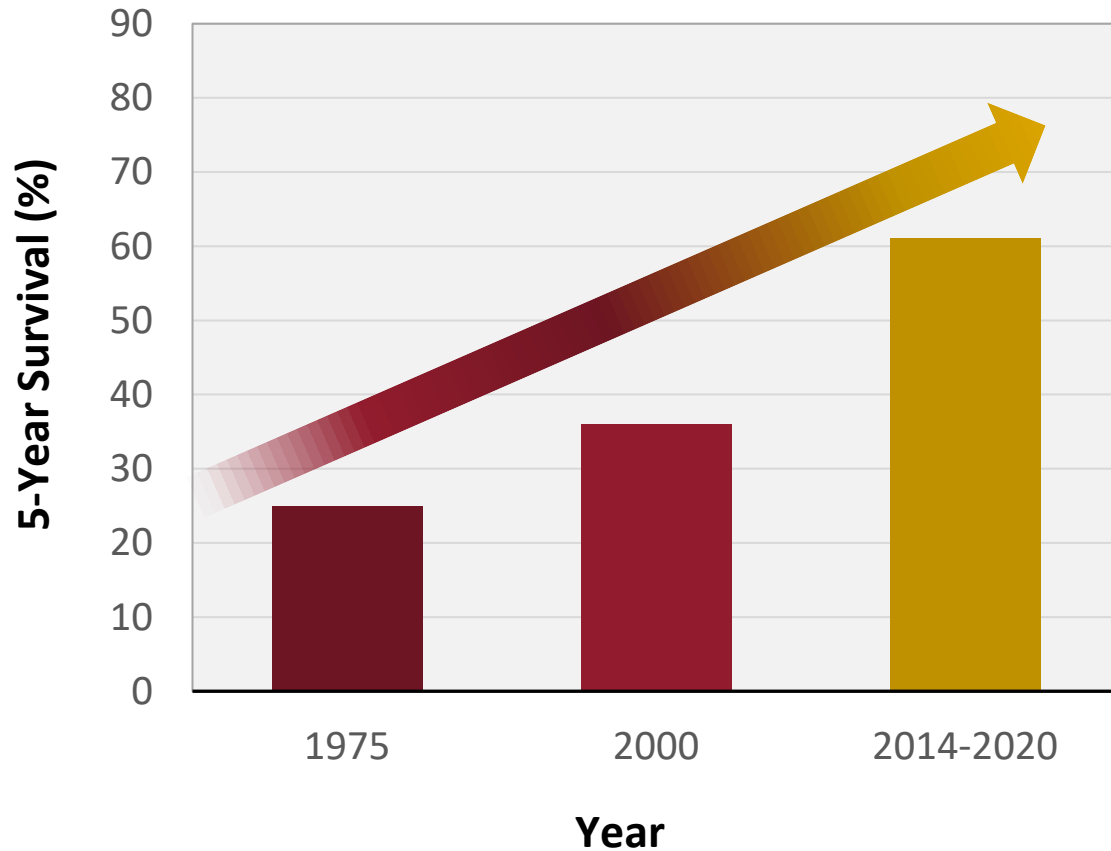
*HIPAA-compliant; not actual patient names.

Donna Catamero, ANP-BC, OCN, CCRC

Beth Faiman, PhD, RN, MSN, APRN-BC, AOCN, BMTCN, FAAN



Patients With Multiple Myeloma Are Living Longer Than Ever



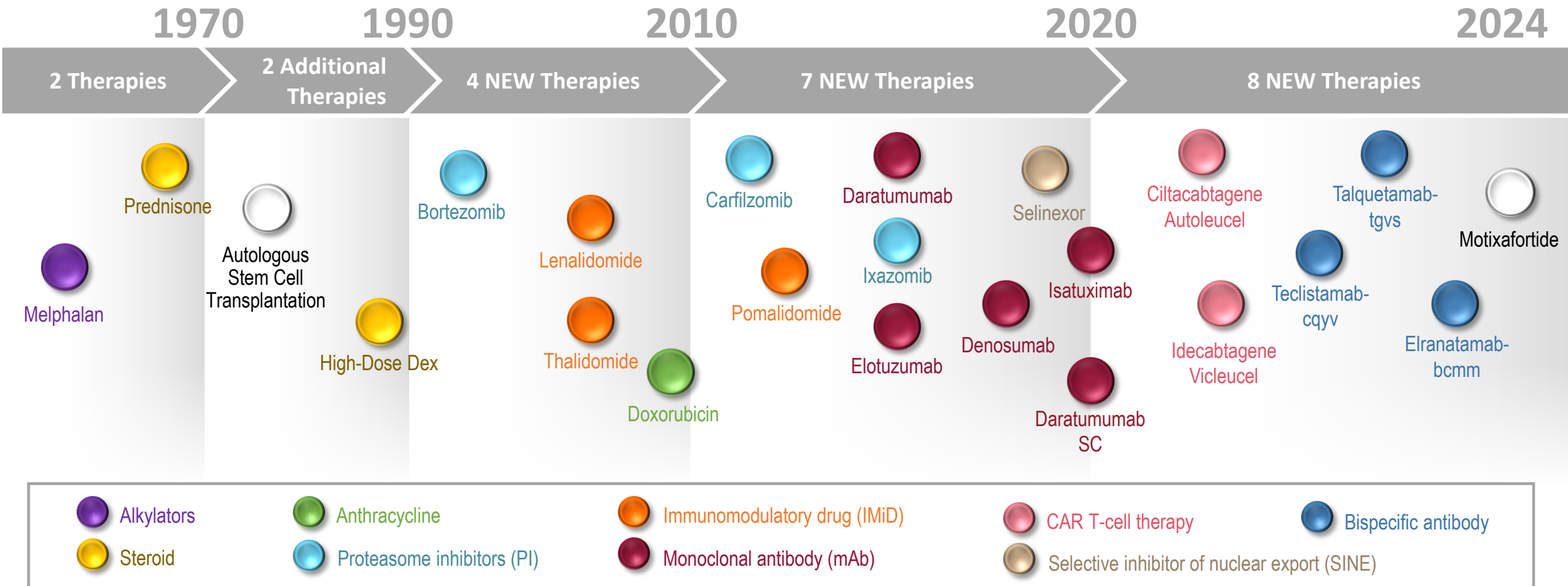
> 60%

LIVE MORE THAN
5 YEARS
after their diagnosis

Many patients are living
10+ YEARS
after their diagnosis!

Particularly those who are
younger and/or have
standard-risk disease

Expanding Treatment Options for Multiple Myeloma

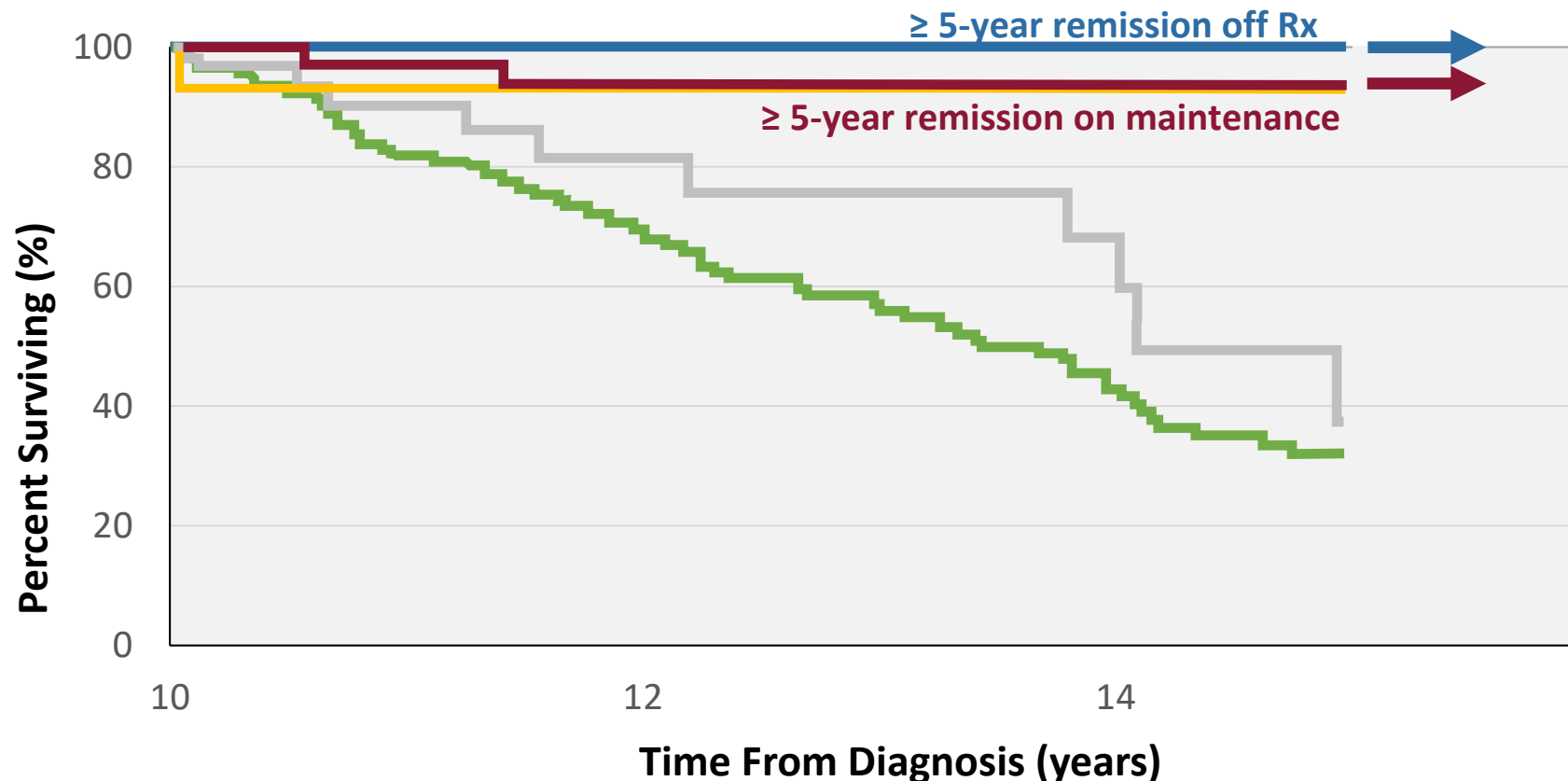


Some Patients ($\approx 17\%$) Do Not Relapse After Their First Treatment for MM



Is there a cure for multiple myeloma?

Mayo Clinic Follow-Up of 2125 Patients With MM at ≥ 10 Years

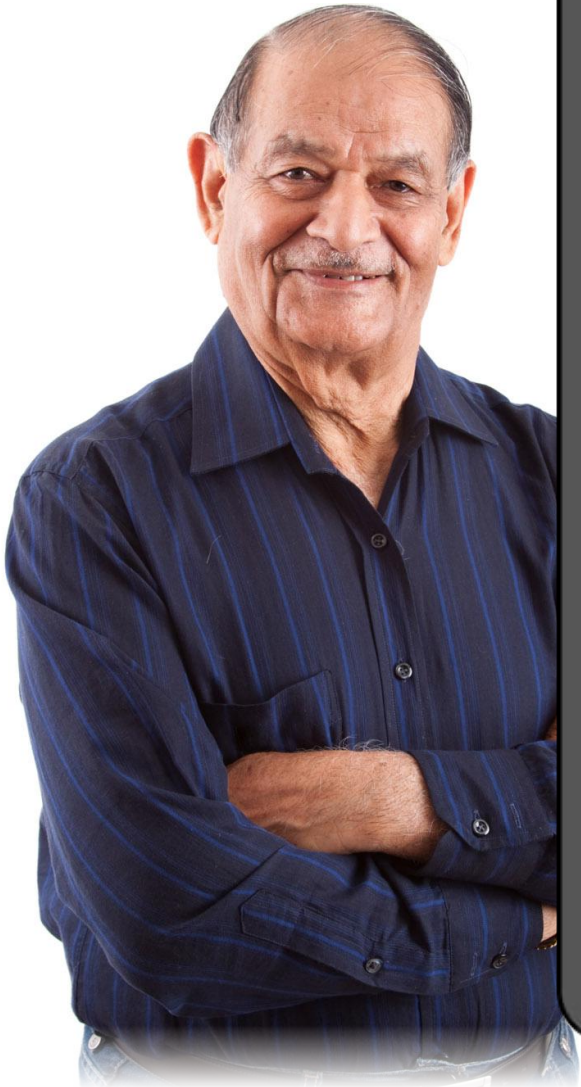


$\approx 17\%$

of long-term survivors of MM may represent patients “operationally cured”

CASE 2

*HIPAA-compliant,
not actual patient
name, stock photo.



MARCUS*

PATIENT NOTES

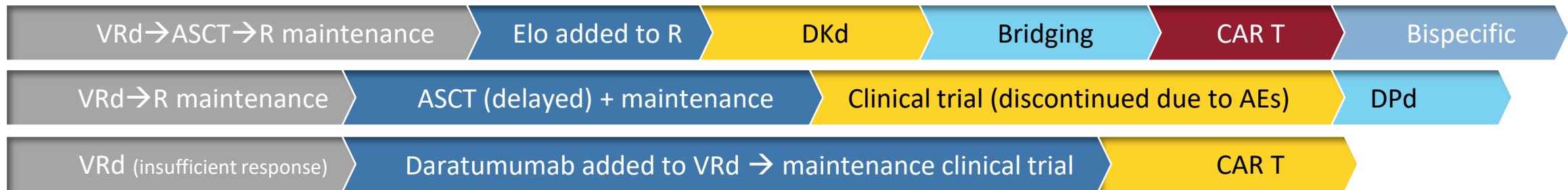
- 68-year-old retired salesman
- Diagnosed with MM in May 2022
 - High risk: del(17p)
 - Treatment plan: RVd → ASCT → maintenance
- August 2022 → Insufficient response (PR) to RVd induction
 - Anti-CD38 added to RVd (CR)
- December 2022 ASCT
- February 2024 maintenance (clinical trial)
- Monthly monitoring of M protein

**How many
lines of
therapy
has Marcus
had?**

Guidelines for Counting Lines of Therapy in Myeloma

MARCUS

Definition of New Line of Therapy	Comment
Discontinuation of 1 treatment regimen and start of another^a	The reasons for discontinuation, addition, substitution, or SCT do not influence how lines are counted. It is recognized that reasons for change may include end of planned therapy, toxicity, progression, lack of response, inadequate response, etc.
Unplanned addition or substitution of 1 or more drugs in a regimen	
In patients undergoing > 1 SCT, each SCT (autologous or allogeneic) is considered a new line of therapy	Note that a planned tandem SCT is an exception and is considered 1 line. Planned induction and/or consolidation maintenance with any SCT (frontline, relapse, autologous or allogeneic) is considered 1 line.



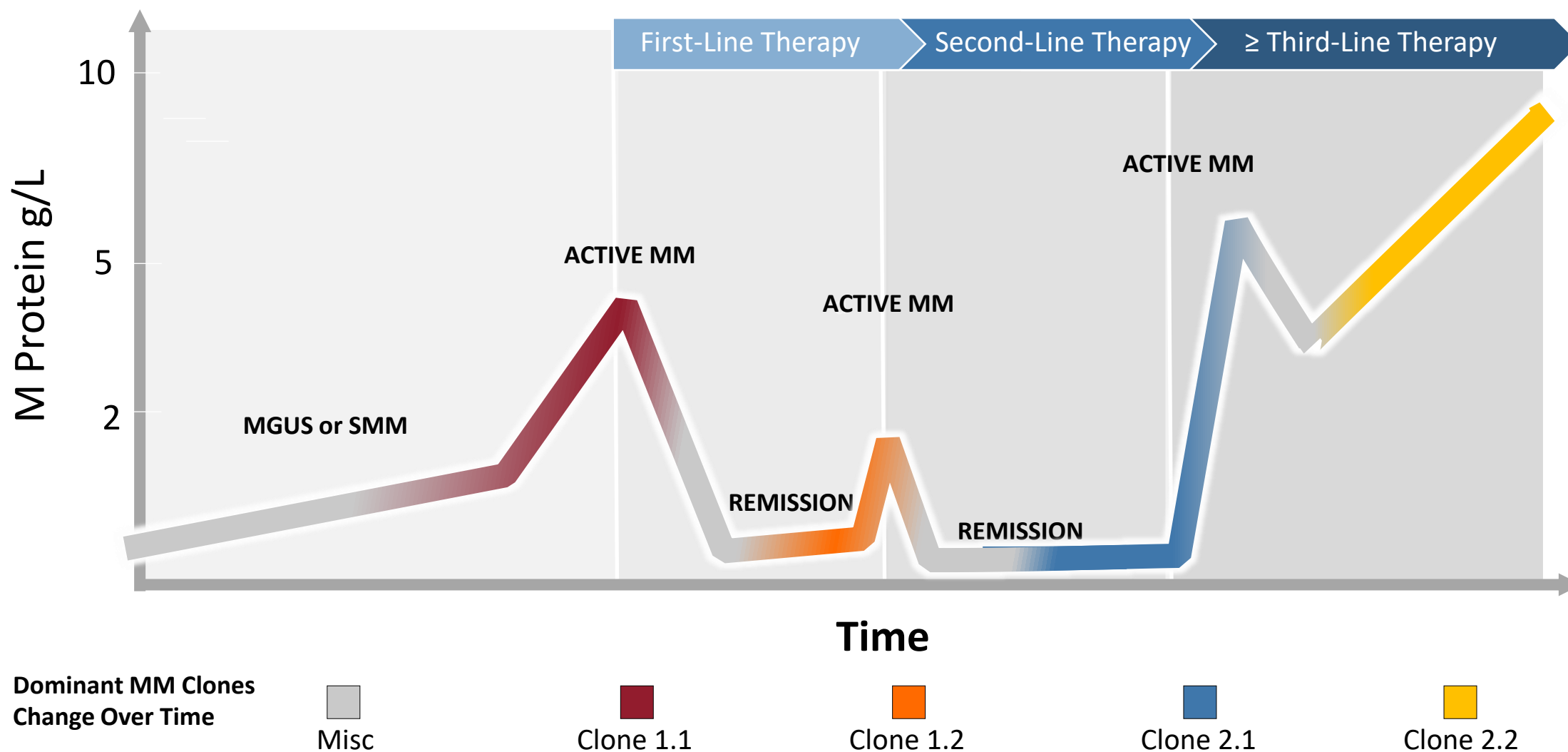
^aA discontinued regimen restarted at a later date will be counted as a new line of therapy if 1 or more other regimens were administered in between. Restarting the same regimen (even with dose modifications) without any other intervening regimen is not considered a new line.

AE = adverse event; ASCT = autologous stem cell transplant; CAR = chimeric antigen receptor; D = daratumumab; DKd = daratumumab, carfilzomib, dexamethasone; DPd = daratumumab, pomalidomide, dexamethasone; Elo = elotuzumab; R = lenalidomide; SCT = stem cell transplant; VRd = bortezomib, lenalidomide, dexamethasone.

Rajkumar SV, et al. *Blood*. 2015;126(7):921-922.

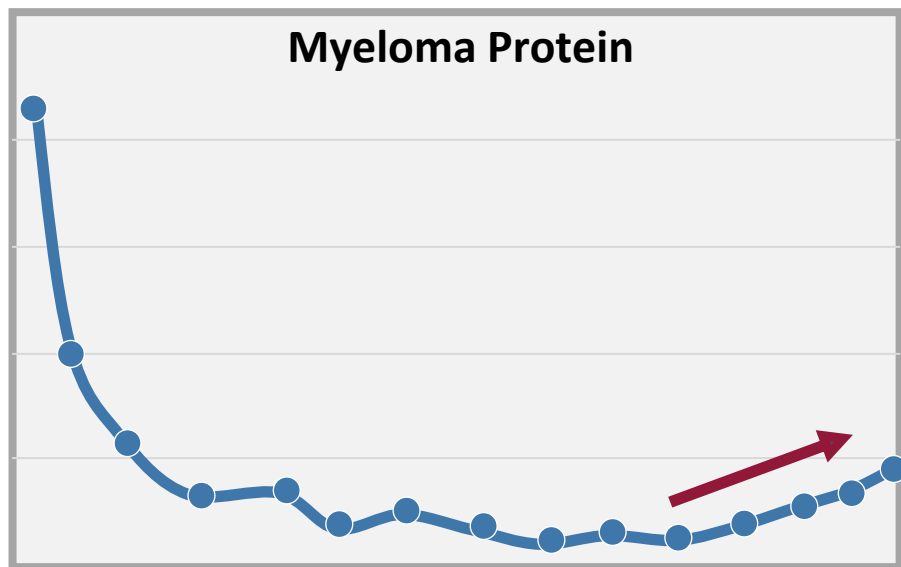


Clonal Evolution: The Relapsing Nature of Multiple Myeloma as Dominant Clones Change Over Time



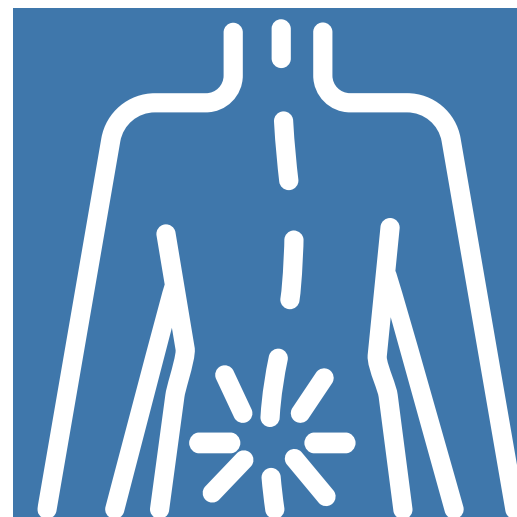


How Patients With Myeloma Relapse



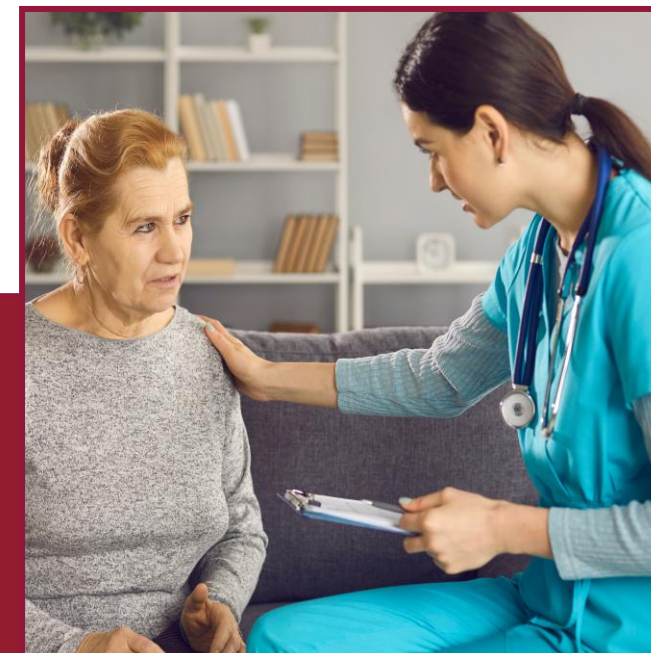
Asymptomatic Biochemical Relapse

- Sequentially rising myeloma protein or free light chain (> 25% increase from low point)
- No other symptoms
- Decisions: if, when, how to treat



Symptomatic

- New or worsening bone pain
- Increasing fatigue, anemia
- Next step: relapse workup; many therapy choices



Psychologically, many patients find their first relapse harder than their initial diagnosis. Nurses are essential for supporting patients!

M protein = monoclonal protein

Noonan K, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):15-21. Faiman B, et al. *J Adv Pract Oncol*. 2016;7(suppl 1):17-29. Kurtin S, et al. *J Adv Pract Oncol*. 2016;7(suppl 1):59-70.

Gerber L. *Nursing*. 2018;48(4):55-58.



Relapse Workup

LAB TESTS

- CBC + differential + chemistry (metabolic panel)
- Serum free light chain (FLC) assay
- Serum protein electrophoresis (SPEP)
- Urine protein electrophoresis (UPEP)

CONSIDER BONE MARROW BIOPSY

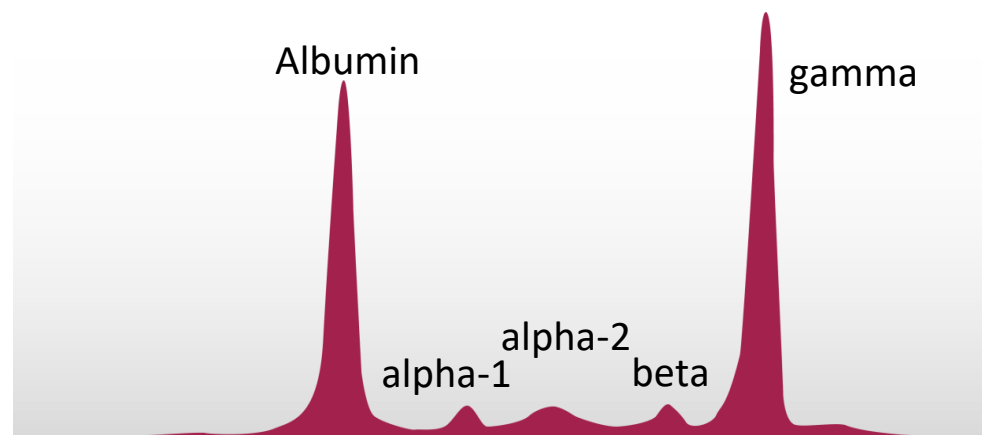
Cytogenetics and FISH (some risk factors can be acquired)

IMAGING



- PET/CT
- WBLDCT
- MRI

Imaging type depends on individual's symptoms and available testing options



CBC = complete blood count; CT = computed tomography; FISH = fluorescence in situ hybridization; FLC = free light chain; MRI = magnetic resonance imaging; PET = positron emission tomography; SPEP = serum protein electrophoresis; UPEP = urine protein electrophoresis; WBLDCT = whole-body low-dose computed tomography.

Noonan K, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):15-21. Rome SI, et al. *Clin J Oncol Nurs*. 2017;21(5 suppl):47-59. Hillengass J, et. *Lancet Oncol*. 2019;20(6):e302-e312. Ghobrial IM, et al. *Blood*. 2014;124:3380-3388.

Rajkumar SV, et al. *Lancet Oncol*. 2014;15:e538-e548. Fauman B. *Clin Lymphoma Myeloma Leuk*. 2014;14:436-440.



Principles of Treatment Selection in Relapse



How is treatment selection determined? Why do some patients receive different drug regimens?



T

Timing of relapse



R

Response to prior therapy



A

Aggressiveness of relapse



P

Performance status



P

Patient preference

- Triplet regimens preferred
- Use at least 2 new drugs
 - CD38 mAbs (isatuximab and daratumumab) should not be used sequentially
- Salvage ASCT may be considered in eligible patients
- Clinical trials should always be considered

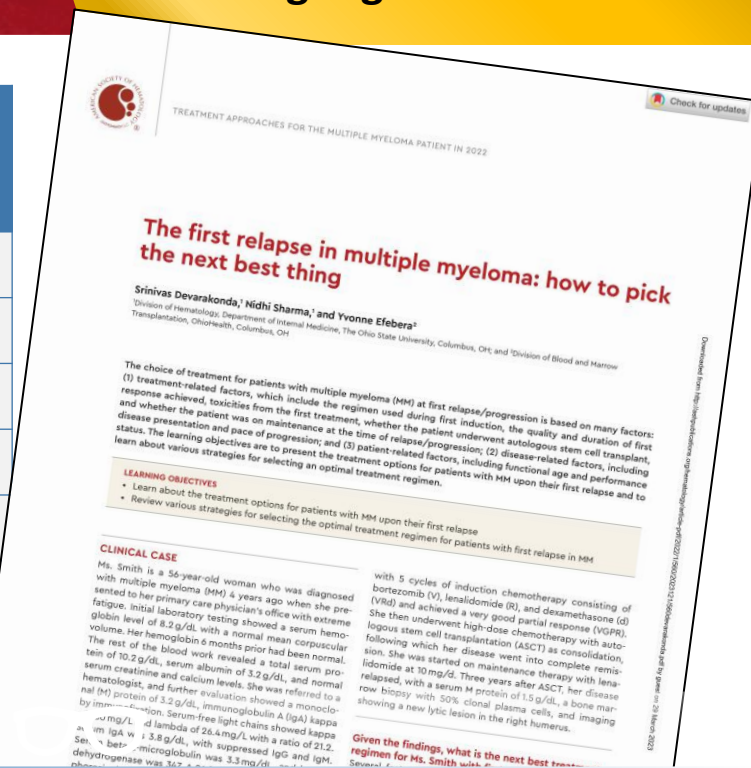


Many Treatment Options at Early Relapse (1-3 Prior Therapies):

Drug Class	FDA-Approved Myeloma Therapies	Common Combinations
PI	Bortezomib	VRd, Vd, VCd
	Carfilzomib	KRd, Kd, DKd, Isa-Kd
	Ixazomib	IRd
IMiD	Lenalidomide	VRd, Rd, KRd, DRd, ERd, IRd
	Pomalidomide ^a	Pd, ^a DPd, Epd, ^a PCd ^b
Anti-CD38	Daratumumab	DRd, DVd, DPd, DVMp, DKd
	Isatuximab	Isa-Pd, ^a Isa-Kd
Anti-SLAMF7	Elotuzumab	ERd, Epd ^a
XPO1 inhibitor	Selinexor	Xd, XVd, DXd, ^b XKd, ^b XPd ^b
CAR T	Idecabtagene vicleucel ^a	
	Ciltacabtagene autoleucel	
New agents or regimens in clinical trials are always an option		



How is treatment selection determined? Why do some patients receive different drug regimens?



WATCH FOR

Evolving treatment paradigms: new data are constantly informing best practices

^a2 or more prior therapies. ^bOff label; not currently FDA approved.

C = cyclophosphamide; CAR = chimeric antigen receptor; D = daratumumab; d = dexamethasone; FDA = US Food and Drug Administration; E = elotuzumab; I = ixazomib; IMiD = immunomodulatory drug; Isa = isatuximab; K = carfilzomib; M = melphalan; P = pomalidomide; p = prednisone; PI = protease inhibitor; SLAMF7 = surface antigen CD319; SQ = subcutaneous; V = bortezomib; X = selinexor; XPO1 = export 1 receptor. Rajkumar SV. 2024 myeloma algorithm. Accessed April 4, 2025. <https://clinicaloptions.com/CE-CME/oncology/2024-mm-algorithm/18440-26989>. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to NCCN.org. Noonan K, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):15-21. Steinbach M, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):23-30. Moreau P, et al. *Lancet Oncol*. 2021;22(3):e105-e118. O'Donnell EK, et al. *Br J Haematol*. 2018;182(2):222-230. Mo CC, et al. *ElHaem*. 2023;4(3):792-810.

Carfilzomib: IV Proteasome Inhibitor

- Active in bortezomib-refractory MM; common agent in regimens for MM, including trials
- Dosing
 - Premedication with dexamethasone
 - Hydration but not overhydration
 - First dose at 20 mg/m² then escalate
 - Dose-dependent 10-minute or 30-minute infusion
- **Consider full anticoagulation for patients at high risk of VTE**
- Herpesvirus prophylaxis
- Diuretic (furosemide or torsemide) or inhalers if needed
- Know cardiac and pulmonary status
 - Optimize heart failure and blood pressure management
- Monitor
 - Blood counts
 - Response
 - Signs of infection
- TIP: Avoid dyspnea over the weekend: start new patients' first dose early in the week
- Patient education

Kd or DKd
≥ 1 prior line^a
20/70 mg/m²
Once weekly
30-min infusion

Kd, DKd, or K
≥ 1 prior line^a
20/56 mg/m²
Twice weekly
30-min infusion

KRd or K
≥ 1 prior line^a
20/27 mg/m²
Twice weekly
10-min infusion

^a1 to 3 prior lines of therapy for DKd, KRd, or Kd.

DKd = daratumumab, carfilzomib, dexamethasone; IV = intravenous; K = carfilzomib; Kd = carfilzomib, dexamethasone; KRd = carfilzomib, lenalidomide, dexamethasone; MM = multiple myeloma; Rd = lenalidomide, dexamethasone; VTE = venous thromboembolism.

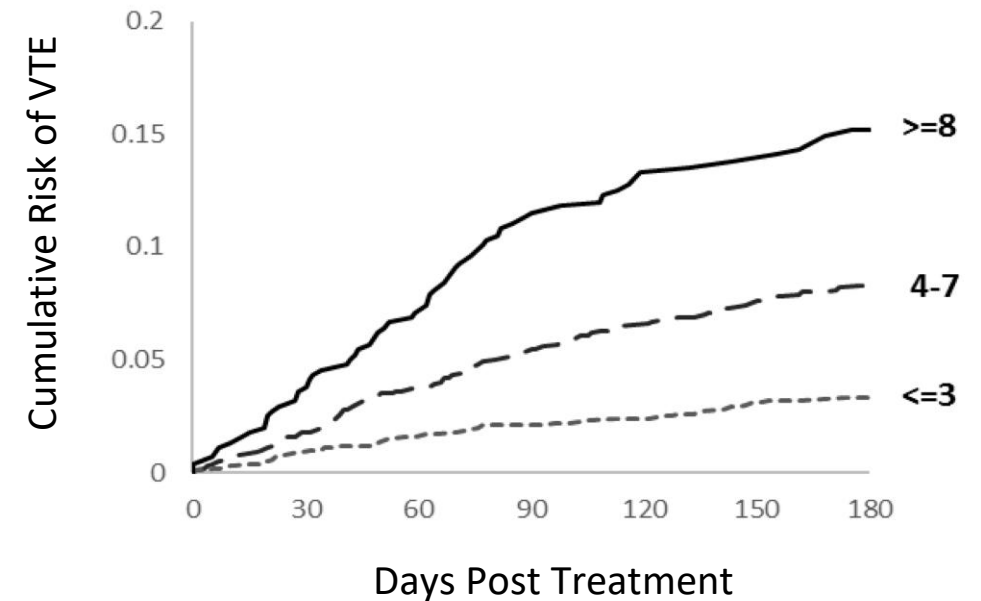
KYPROLIS® (carfilzomib) Prescribing Information. Stewart K, et al. *N Engl J Med*. 2015;372:142-152.

IMPEDE VTE Score Can Assess VTE Risk in Patients With Multiple Myeloma

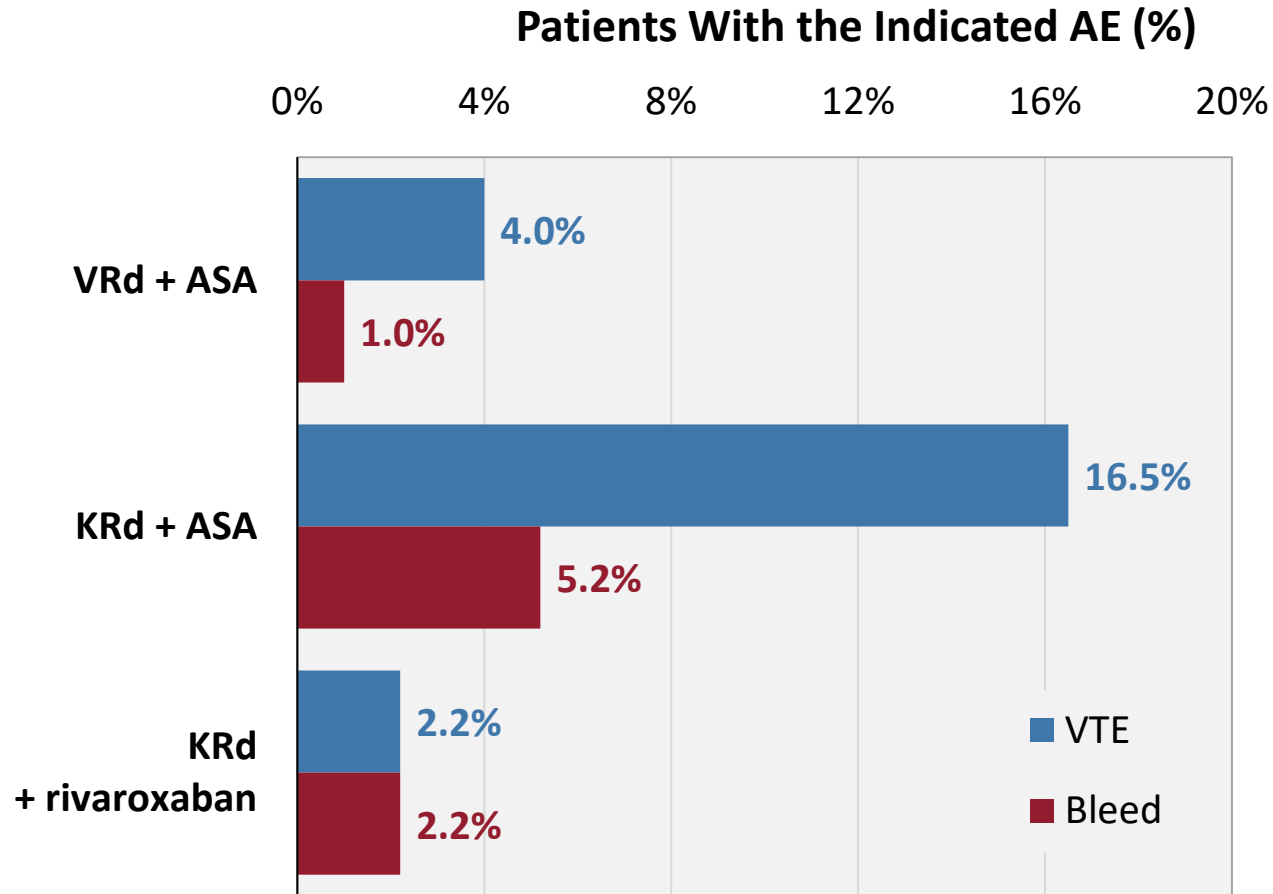
IMPEDE VTE Score

Predictor	Acronym	Score
<u>I</u> mmunomodulatory drug	I	4
Body <u>M</u> ass index $\geq 25 \text{ kg/m}^2$	M	1
<u>P</u> elvic, hip, or femur fracture	P	4
<u>E</u> rythropoiesis-stimulating agent	E	1
<u>D</u> oxorubicin	D	3
<u>D</u> examethasone		
High dose		4
Low dose		2
<u>E</u> thnicity/Race = Asian/Pacific Islander	E	-3
History of <u>V</u> enous thromboembolism before MM	V	5
<u>T</u> unneled line central venous catheter	T	2
<u>E</u> xisting thromboprophylaxis: therapeutic LMWH or warfarin	E	-4
<u>E</u> xisting thromboprophylaxis: prophylactic LMWH or aspirin		-3

...the IMPEDE VTE score outperformed IMWG guidelines and NCCN Guidelines® and could be considered the new risk stratification standard for VTE in MM



Full Anticoagulation Is Preferred for Patients on Carfilzomib Regimens



Tip: Rivaroxaban co-pay may be covered by an LLS grant or other cancer-related assistance IF indicated that it is necessary for myeloma treatment

Rivaroxaban may be a more-effective antithrombotic agent for patients receiving carfilzomib- or lenalidomide-based regimens



Pomalidomide: Oral IMiD

- Active in R-refractory patients; common agent in regimens for MM, including trials
- Monitor
 - Blood counts—neutropenia most-frequent grade 3/4 AE
 - Liver function
 - Response
- REMS program
- Proactive AE management
- Patient education
 - Oral adherence
 - REMS process for refills
 - DVT prophylaxis
 - Common AEs: low blood counts, infection, GI AEs
 - Refrain from smoking (reduces pomalidomide exposure)
 - Protect renal health (renal excretion of pomalidomide)
 - Hydration
 - Avoid NSAIDs, IV contrast, other drugs with renal interactions

DPd
(1 or more prior therapies)

EPd
(≥ 2 prior therapies)

Pd
(≥ 2 prior therapies)



Clinical Pearl
Can often be started at 2 mg instead of 4 mg



Selinexor: Oral Selective Inhibitor of Nuclear Export (SINE)

- Oral SINE; XPO1 inhibitor
- Standard practice is to dose selinexor weekly
- Consider sequencing before MM therapies such as CAR T-cell therapy and bispecific antibodies, which rely on T-cell fitness for activity
- Watch for regimens that optimize dosing, such as all-oral XPd with selinexor dosed at 40 mg weekly (ASCO 2023 e20006)

- **Clinical pearls**

- Patient education and expectations
- Proactive AE management is crucial
 - Patients must be given 2 antiemetics prophylactically for the management of nausea and anorexia (start ondansetron day 1; add olanzapine and/or aprepitant)
 - Thrombocytopenia and neutropenia (weekly blood counts in cycle 1)
 - Hyponatremia (salty snacks, oral hydration)—infrequent with current regimens
 - Diarrhea (oral hydration)

XVd

(≥ 1 prior therapy)

Xd

(≥ 4 prior therapies: refractory to 2 PIs, 2 IMiDs, anti-CD38 mAb)

RECENT DATA

Selinexor has the potential to lessen T-cell exhaustion, which may improve the effectiveness of some MM therapies and reduce infections



STOMP: Multi-Arm Selinexor Combination Phase 1/2 Trial Demonstrated Favorable Results

All-Oral XPd Arm

- Patients (n = 81) with RRMM (median 3 prior lines of therapy)
- Selinexor dosed weekly 60 mg or 40 mg in combination with Pd
- P doses tested consisted of 2 mg, 3 mg, or 4 mg QD

Results

- Median time to response: 1.1 months (95% CI, 1.0-2.0)
- ORR
 - XPd60: 55.0% (95% CI, 31.5-76.9)
 - XPd40: 43.8% (95% CI, 19.8-70.1)

Conclusions

- TEAEs were less frequent, duration of exposure was longer, and higher dose intensity was achieved for patients treated with XPd40 vs XPd60
- XPd40 to be studied further

XKd Arm

- Patients (n = 32) with RRMM (median 4 prior therapies)
- ORR 78% (44% VGPR or better)
- Median PFS: 15 months

Subset Analysis in Triple-Class Refractory

- Refractory to IMiDs, PIs, and anti-CD38 mAb (n = 12)
 - 66.7% had high-risk cytogenetics: del(17p), t(4;14), t(14;16), and/or gain 1q
- ORR: 66.7% (95% CI, 34.9-90.1)
- mDOR: 12 months



WATCH FOR

New combinations
with selinexor

del = deletion; IMiD = immunomodulatory drug; mAb = monoclonal antibody; mDOR = median duration of response; ORR = overall response rate; P = pomalidomide; Pd = pomalidomide, dexamethasone; PFS = progression-free survival; PI = proteasome inhibitor; QD = once daily; QW = once weekly; RRMM = relapsed/refractory multiple myeloma; t = translocation; TEAE = treatment-emergent adverse event; XKd = selinexor, carfilzomib, dexamethasone; XPd = selinexor, pomalidomide, dexamethasone; XPd40 = selinexor 40 mg QW, pomalidomide, dexamethasone; XPd60 = selinexor 60 mg QW, pomalidomide, dexamethasone.

Baljevic M, et al. ASH 2024 Abstr #1996. Gasparetto C, et al. *Br J Cancer*. 2022;126:718-725. Schiller GJ, et al. ASH 2022. Abstr #652.

Patient Eligibility for CAR T-Cell Therapy: General Criteria



Who is a candidate for CAR T-cell therapy?

CAR T-cell therapies may be appropriate for patients with RRMM and ...

Specific criteria may vary depending on CAR T-cell therapy center

- ✓ ECOG PS: 0-2
- ✓ Adequate organ function
 - CrCl > 30 mL/min (appropriate dose reduction of therapy—primarily fludarabine)
- ✓ Ability to tolerate lymphodepleting chemotherapy, CAR T-cell therapy process, and potential toxicities
- ✓ No active or serious infections (ie, fungal, bacterial, viral)
- ✓ Sufficient social support
 - Caregiver support before, during, and after therapy
 - Multiple travel and housing support systems

CASE 2

*HIPAA-compliant,
not actual patient
name, stock photo.



MARCUS*

PATIENT NOTES

February 2024

- Started discussions about possibility of relapse

April 2024

- Discussed CAR T-cell therapy as possible next option
- Caregivers: wife and adult children
- Daughter lives near a CAR T center

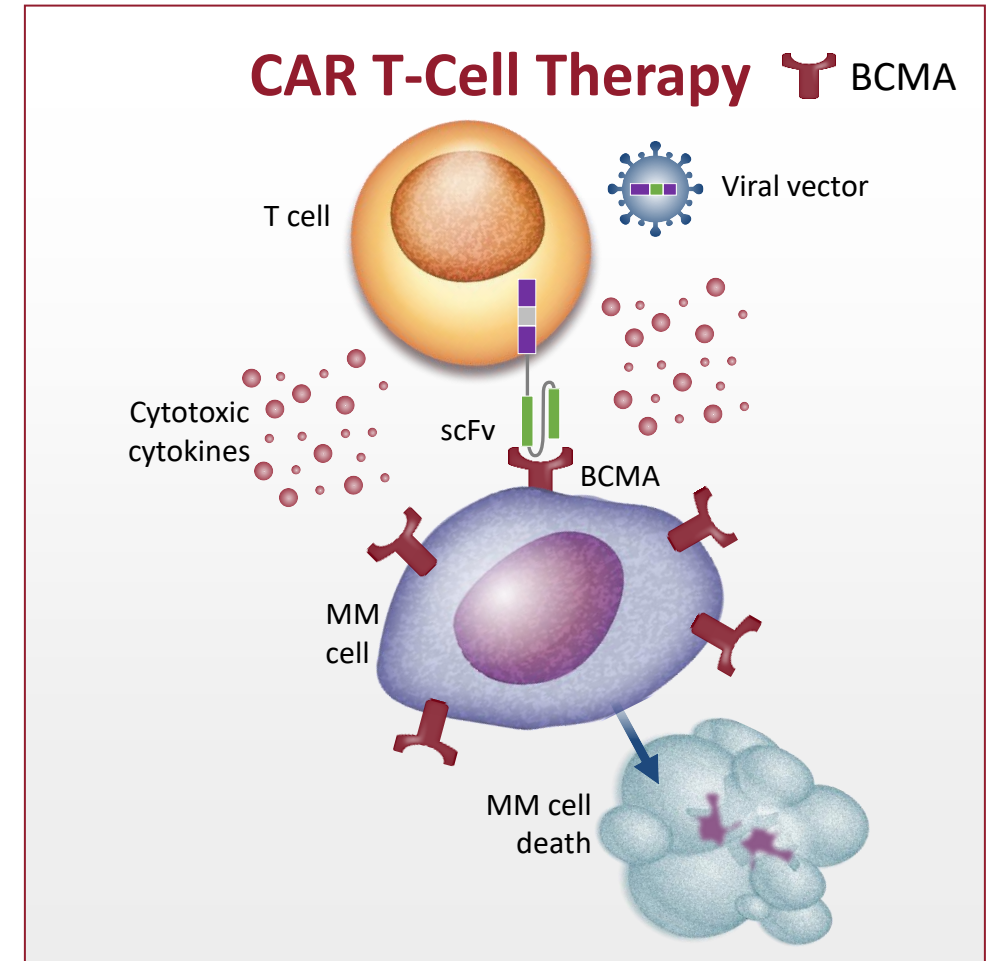
May 2024

- Financial and medical consult at CAR T center

Provide tools
and resources
to enhance
decision-making

BCMA Is the Target for FDA-Approved CAR T-Cell Therapies

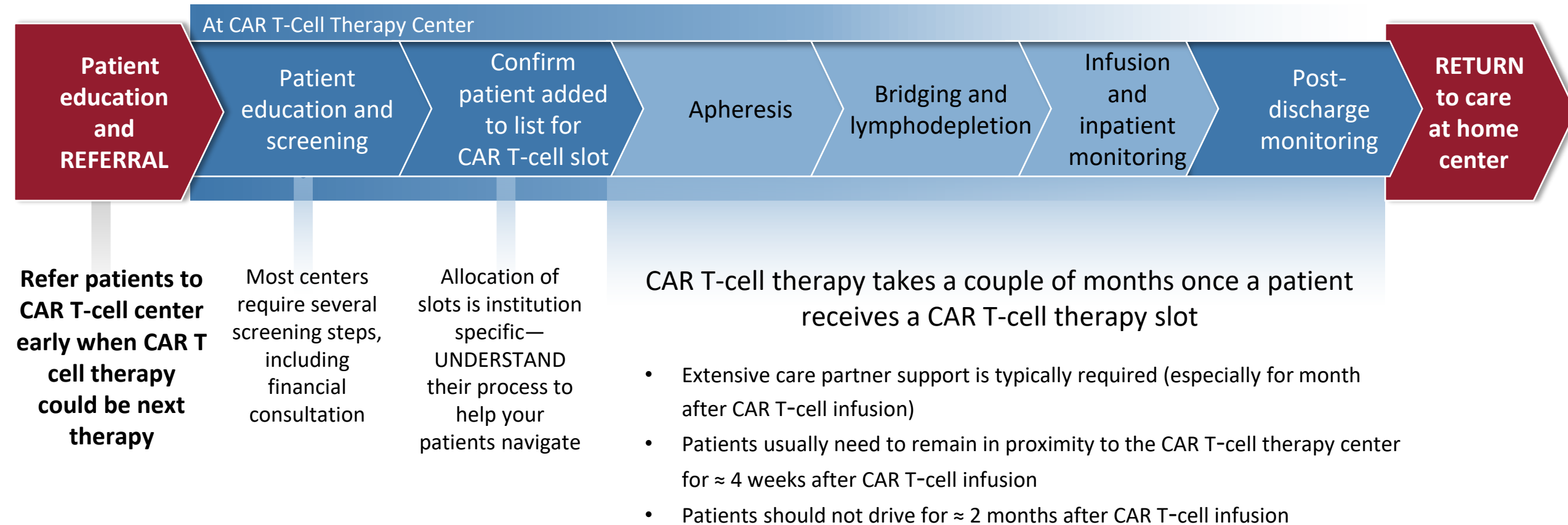
- BCMA (B-cell maturation antigen)
- Member of TNF receptor superfamily
- BCMA is expressed on late memory B cells committed to PC differentiation and PCs
- BCMA plays a role in survival of long-lived PCs
- BCMA is expressed more abundantly on malignant PCs than on normal ones



CAR T-Cell Therapy: Steps

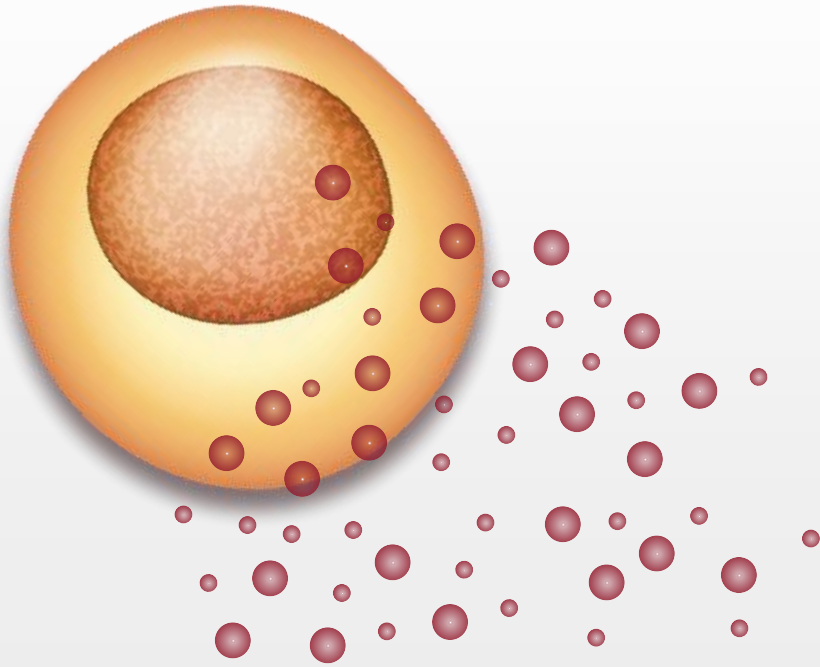


What are the barriers to CAR T & how can nurses help?

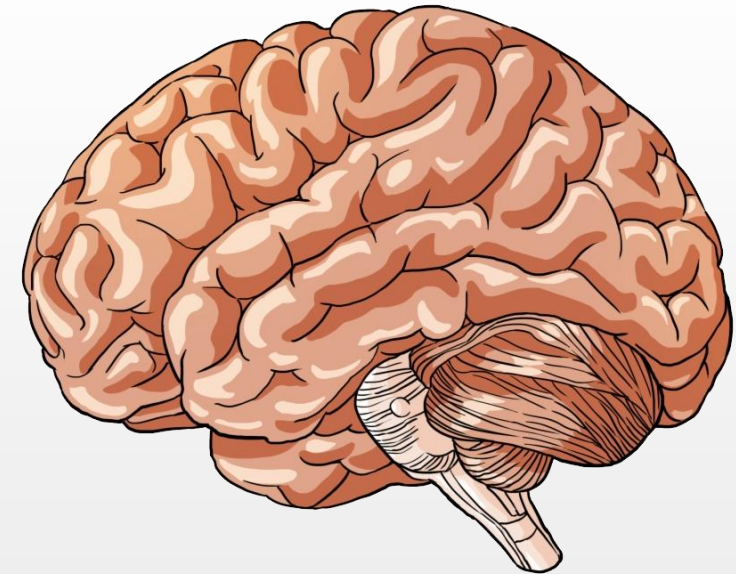


Immune Activity—Specific Side Effects

**Cytokine release
syndrome (CRS)**

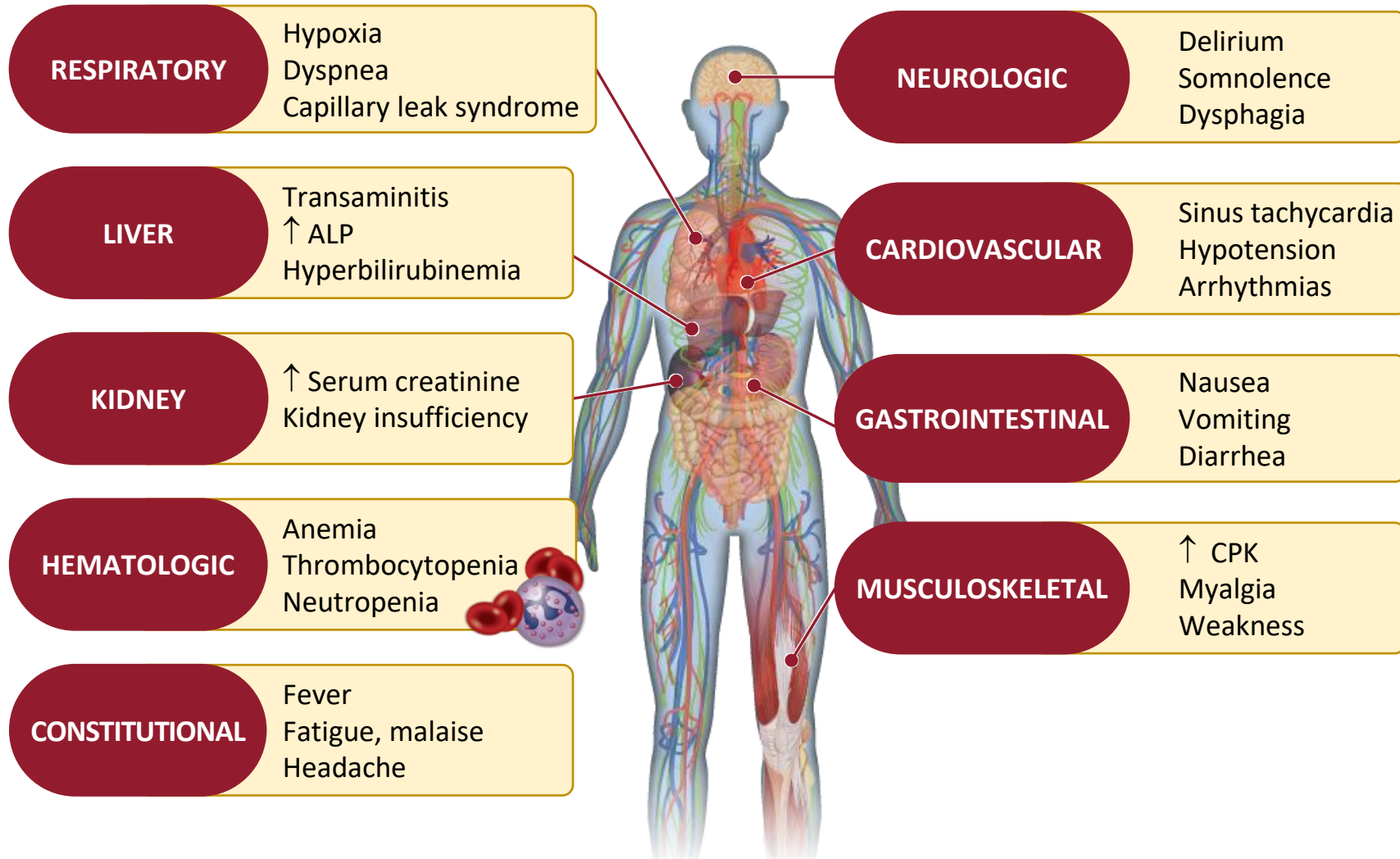


**Immune effector cell–associated
neurotoxicity syndrome (ICANS)**



Neurotoxicity

CRS Severity Ranges From Mild to Life-Threatening: Early Recognition and Treatment Is Key



Monitoring for CRS

- **Vital signs (temperature, O₂ saturation, etc)**
- **Review of systems and physical exam**
 - Focus on cardiovascular, pulmonary, and neurologic systems
- **Rule out infection**
- **Laboratory monitoring**
 - CRP
 - Cytokines
 - Ferritin
 - LDH

ALP = alkaline phosphatase; CPK = creatine phosphokinase; CRP = C-reactive protein; CRS = cytokine release syndrome; LDH = lactate dehydrogenase; O₂ = oxygen.

Oluwole OO, Davila ML. *J Leukoc Biol.* 2016;100:1265-1272. June CH, et al. *Science.* 2018;359:1361-1365. Brudno JN, Kochenderfer JN. *Blood.* 2016;127(26):3321-3330. Brudno JN, Kochenderfer JN. *Blood Rev.*

2019;34:45-55. Shimabukuro-Vornhagen, et al. *J Immunother Cancer.* 2018;6:56. Lee DW, et al. *Biol Blood Marrow Transplant.* 2019;25:625-638.

ASTCT CRS Consensus Grading

**Fever is a parameter
for CRS grading**

CRS Parameter	Grade 1	Grade 2	Grade 3	Grade 4
Fever^a	Temperature ≥ 38° C	Temperature ≥ 38° C	Temperature ≥ 38° C	Temperature ≥ 38° C
		With		
Hypotension	None	Not requiring vasopressors	Requiring a vasopressor with or without vasopressin	Requiring multiple vasopressors (excluding vasopressin)
		and/or^b		
Hypoxia	None	Requiring low-flow nasal cannula ^c or blow-by	Requiring high-flow nasal cannula, ^c face mask, nonrebreather mask, or Venturi mask	Requiring positive pressure (eg, CPAP, BiPAP, intubation and mechanical ventilation)

Organ toxicities associated with CRS may be graded according to Common Terminology Criteria for Adverse Events v5.0 but not influence CRS grading.

^aFever is defined as temperature ≥ 38° C not attributable to any other cause. In patients who have CRS and receive antipyretic or anticytokine therapy such as tocilizumab or steroids, fever is no longer required to grade subsequent CRS severity. In this case, CRS grading is driven by hypotension and/or hypoxia. ^bCRS grade is determined by the more-severe event: hypotension or hypoxia not attributable to any other cause. For example, a patient with a temperature of 39.5° C, hypotension requiring 1 vasopressor, and hypoxia requiring low-flow nasal cannula is classified as grade 3 CRS. ^cLow-flow nasal cannula is defined as oxygen delivered at ≤ 6 L/minute. Low flow also includes blow-by oxygen delivery, sometimes used in pediatrics. High-flow nasal cannula is defined as oxygen delivered at > 6 L/minute.

ASTCT = American Society for Transplantation and Cellular Therapy; BiPAP = bilevel positive airway pressure; CPAP = continuous positive airway pressure; CRS = cytokine release syndrome.

Lee DW, et al. *Biol Blood Marrow Transplant*. 2019;25:625-638.

Managing CRS Is Institution Specific

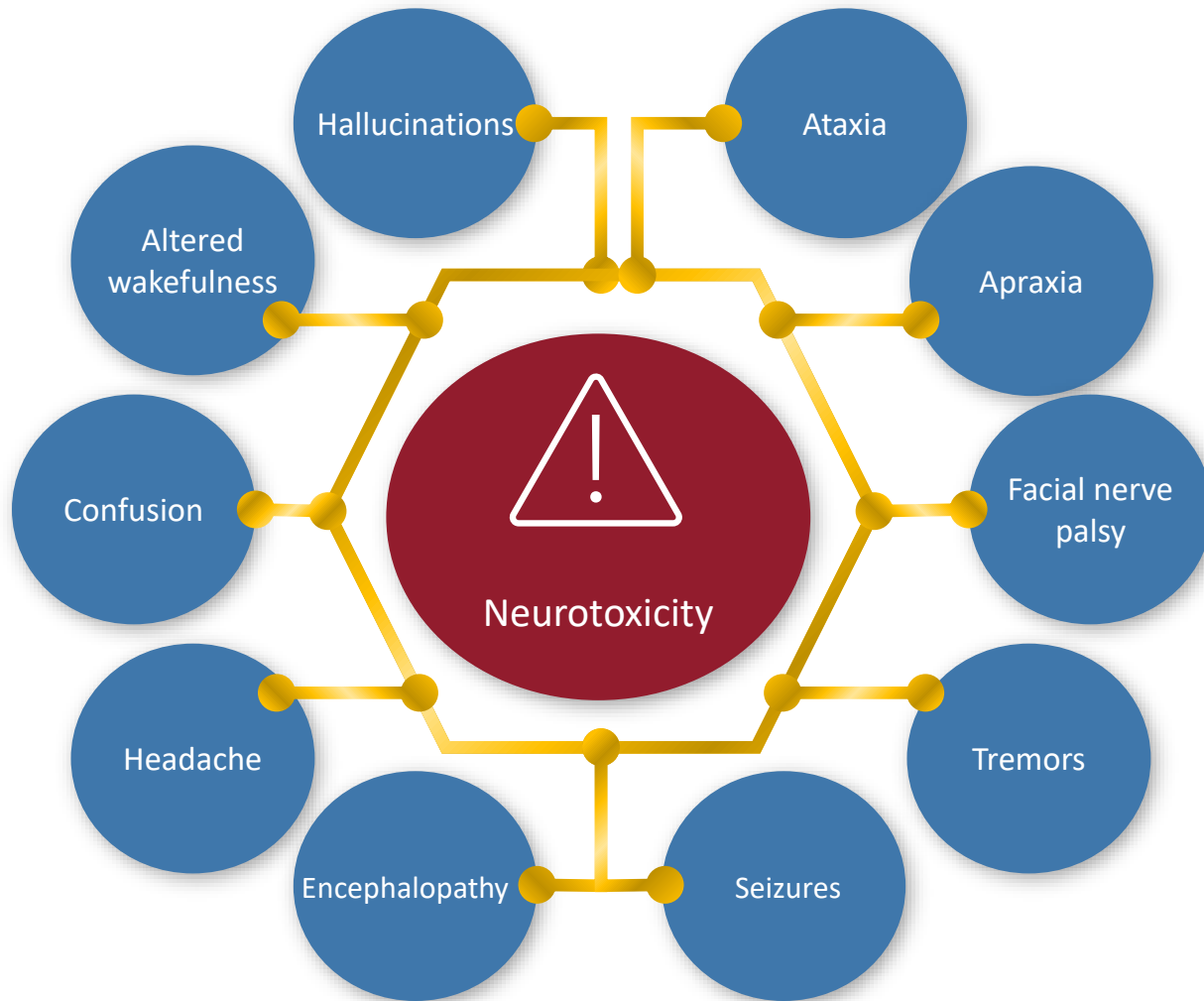
After 2 doses of tocilizumab, consider alternative anticytokine agents; do not exceed 3 doses of tocilizumab in 24 hours, or 4 doses total

ASTCT CRS Grade	Management (Example Guideline)
1	<ul style="list-style-type: none">Antipyretics and IV hydrationDiagnostic workup to rule out infectionAntibiotics if neutropenicConsider tocilizumab
2	<ul style="list-style-type: none">Supportive care as in grade 1IV fluid boluses and/or supplemental oxygenTocilizumab ± dexamethasone (or its equivalent of methylprednisolone)
3	<ul style="list-style-type: none">Supportive care as in grade 1Consider monitoring in ICUVasopressor support and/or supplemental oxygenTocilizumab + dexamethasone 10 to 20 mg IV every 6 hours (or its equivalent of methylprednisolone)
4	<ul style="list-style-type: none">Supportive care as in grade 1Monitoring in ICUVasopressor support and/or supplemental oxygen via positive-pressure ventilationTocilizumab + methylprednisolone 1000 mg/day



Clinical Pearl:
Institution-specific guidelines for managing CRS vary

Neurotoxicity: Rare but Potentially Serious AE



Monitoring for ICANS

- ICE screening tool
- Review of systems and physical exam
 - Focus on neurologic system
- Rule out infection
- If ICANS suspected
 - Neuroimaging (ideally MRI)
 - Diagnostic lumbar puncture for opening pressure and infection tests
- Corticosteroids are typically indicated for ICANS \geq grade 2
- Patient and care partner information

ICE Screening Tool for Neurologic Assessment



How should ICANS be monitored and for how long?

Assessment		Points
Orientation	Orientation to year, month, city, hospital	4
Naming	Ability to name 3 objects (eg, point to clock, pen, button)	3
Following Commands	Ability to follow simple commands (eg, “Show me 2 fingers” or “Close your eyes and stick out your tongue”)	1
Writing	Ability to write a standard sentence (eg, “Our national bird is the bald eagle”)	1
Attention	Ability to count backwards from 100 by 10	1
Total Points		10

Scoring	
10	No impairment
7-9	Grade 1 ICANS
3-6	Grade 2 ICANS
0-2	Grade 3 ICANS
0 due to patient unarousable and unable to perform ICE assessment	Grade 4 ICANS

Neurotoxicity

- Can occur:
 - In the absence of CRS
 - Concurrent with CRS
 - More commonly, after CRS
- Considered to be a distinct process from CRS
- The exact mechanism of neurologic toxicity is not known
- Endothelial injury, possibly resulting from proinflammatory cytokines, may contribute
- Onset can vary widely and can be acute or chronic
 - Short-term acute (eg, palsy) vs delayed onset (eg, lack of focus, or “chemo brain”)
- Toxicities tend to be self-limited and reversible

3/27	I LOVE MY FAMILY!
3/28	I LOVE MY FAMILY!
3/28	I LOVE MY FAMILY!
3/29	I LOVE MY FAMILY!
3/29	I LOVE MY FAMILY!

CRS = cytokine release syndrome.

Lee DW, et al. *Biol Blood Marrow Transplant*. 2019;25:625-638. Brudno JN, Kochenderfer JN. *Blood*. 2016;127(26):3321-3330. Oluwole OO, Davila ML. *J Leukoc Biol*. 2016;100:1265-1272. June CH, et al. *Science*. 2018;359:1361-1365. Brudno JN, Kochenderfer JN. *Blood Rev*. 2019;34:45-55. Catamero D, et al. Presented at: 20th International Myeloma Society (IMS) Annual Meeting Nurse Symposium; September 27-30, 2023; Athens, Greece.



Idecabtagene Vicleucel (Ide-Cel)

CAR T-Cell Therapy Targeting BCMA

- ORR = 72%; median DOR = 11 months^a
- REMS program
- Any-grade CRS: 89% all grades (310/349); grade ≥ 3 : 7% (23/349)
 - Median time to onset: 1 day (range: 1-27)
 - Median duration: 5 days (range 1-63)
 - Symptoms: pyrexia 87%, hypotension 30%, tachycardia 26%, chills 19%, hypoxia 16%
- Neurotoxicity
 - 40% any grade (139/349); 4% grade 3; 0.6% grade 4
 - Median time to onset: 2 days (range: 1-148)
 - Median duration: 8 days (range 1-720)
 - 89% resolved (123/139)
 - 67% occurred during CRS
 - Tremor, parkinsonism has occurred

- Neurotoxicity (continued)
 - ICANS grade 3 or 4: 5.6% for 460 to 510×10^6 cells; 3.7% for 300 to 460×10^6 cells
 - ICANS symptoms: encephalopathy 21%, headache 15%, dizziness 8%, delirium 6%, tremor 6%
- HLH/MAS: 2.9% (10/349)
 - Median onset: 6.5 days (range: 4-10)
 - All occurred with ongoing or worsening CRS
 - 5 patients had overlapping neurotoxicity
- Prolonged cytopenias
 - Prolonged neutropenia: 40%; median time to recovery 1.9 months
 - Prolonged thrombocytopenia: 42%; median time to recovery 1.9 months
 - Grade 3 or 4 thrombocytopenia: 62% for 460 to 510×10^6 cells 56% for 300 to 460×10^6 cells

**RRMM after
2 or more prior lines
of therapy**
(including a PI, an IMiD, and
an anti-CD38 mAb)



**Find a Treatment Center
at AbecmaFinder.com**

^a > 5+ lines of prior therapy from KarMMa clinical trial results.

BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CRS = cytokine release syndrome; DOR = duration of response; HLH = hemophagocytic lymphohistiocytosis; ICANS = immune effector cell-associated neurotoxicity syndrome; IMiD = immunomodulatory drug; mAb = monoclonal antibody; MAS = macrophage activation syndrome; ORR = overall response rate; PI = proteasome inhibitor; REMS = Risk Evaluation and Mitigation Strategy; RRMM = relapsed/refractory multiple myeloma.

ABECMA® (idecabtagene vicleucel) Prescribing Information.



KarMMa-3: Ide-Cel Improved PFS and OS vs SOC in Patients With RRMM

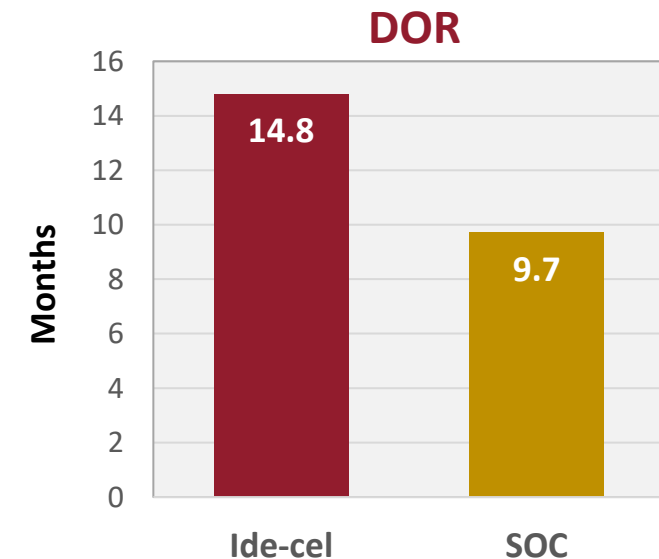
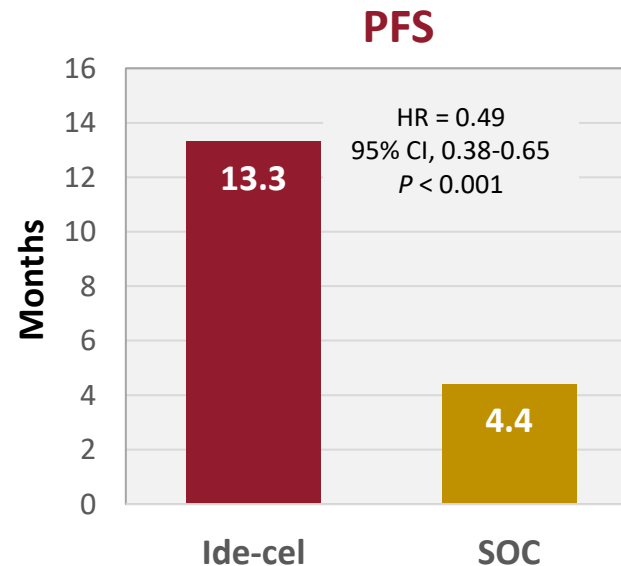
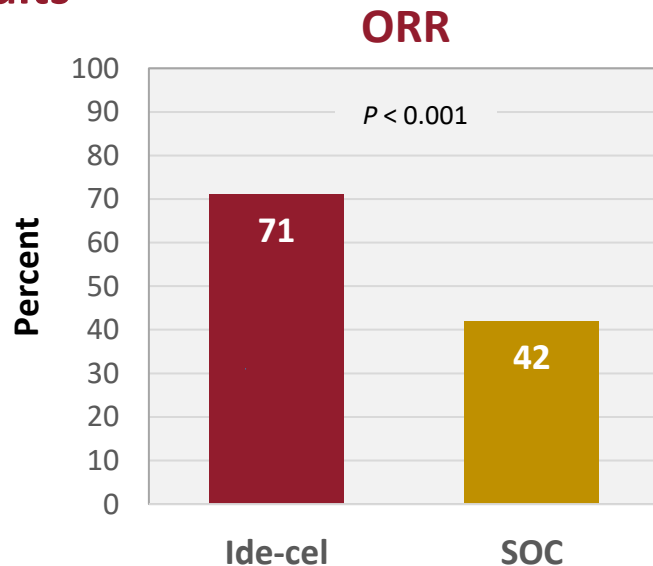
KarMMa-3: Ide-Cel Phase 3 Clinical Trial

- 386 patients with RRMM (ide-cel n = 254; standard regimen [5 options] n = 132)
 - 66% triple-class refractory
 - 95% daratumumab refractory

Health-Related Quality of Life (HRQOL)

- Ide-cel improved HRQOL compared with SOC
- Ide-cel had shorter time to clinically meaningful improvement than SOC across most domains (physical function, cognitive function, social function, global quality of life, fatigue, etc)

Results



AE = adverse event; CRS = cytokine release syndrome; HR = hazard ratio; HRQOL = health-related quality of life; ide-cel = idecabtagene vicleucel; MM = multiple myeloma; OS = overall survival; ORR = overall response rate; PFS = progression-free survival; RR = relapsed/refractory multiple myeloma; SOC = standard of care.

Rodríguez-Otero P, et al. *N Engl J Med*. 2023;388:1002-1014. Delforge M, et al. *Lancet Haematol*. 2024;11(3):e216-e227.



Ciltacabtagene Autoleucel (Cilta-Cel)

CAR T-Cell Therapy With 2 BCMA-Targeting Domains

- ORR = 85%; DOR not reached at a median follow-up of 33.6 months
- REMS program
- Any-grade CRS: 84% (238/285); grade 3 CRS: 4% (11/285)
 - Median time to onset: 7 days (range: 1-23)
 - Median duration: 4 days (range 1-97)
 - Symptoms: fever (84%), hypotension (29%), and AST increase (11%)
- Neurotoxicity
 - 24% any grade (69/285)
 - 7% grade 3 or higher (19/285)
 - Parkinsonism: 3%, 56 days median onset
 - PN: 7%, 57 days median onset
- Neurotoxicity (continued)
 - ICANS: 13% any grade (36/285); 2% grade 3 or 4 (6/285)
 - Median time to onset: 8 days (range: 1-28)
 - Median duration: 6 days (range: 1-1229)
 - Resolution in 83% (30/36); median time 3 days (range: 1-143)
 - Occurred during CRS in 69% of patients
- HLH/MAS: 1% (3/285)
 - Median onset: 10 days (range: 8-99)
 - All occurred with ongoing or worsening CRS
- Prolonged cytopenias
 - Grade 3 or higher cytopenias not resolved by day 30: 62% (176/285); included thrombocytopenia 33%, neutropenia 27%, lymphopenia 24%, anemia 2%
 - Recurrence of grade 3 cytopenias after day 60: lymphopenia 22%, neutropenia 20%, thrombocytopenia 5%, anemia 5%
 - 77% had 1 or more recurrences of grade 3 or 4 cytopenias after initial recovery of grade 3 or 4 cytopenia

RRMM after
at least 1 prior line
of therapy of therapy
(including a PI, an IMiD, and
refractory to lenalidomide)



Find a Treatment Center at
<https://www.carvyktihcp.com/treatment-centers>

AST = aspartate aminotransferase; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CRS = cytokine release syndrome; DOR = duration of response; HLH = hemophagocytic lymphohistiocytosis; ICANS = immune effector cell-associated neurotoxicity syndrome; IMiD = immunomodulatory drug; mAb = monoclonal antibody; MAS = macrophage activation syndrome; ORR = overall response rate; PI = proteasome inhibitor; PN = peripheral neuropathy; REMS = Risk Evaluation and Mitigation Strategy; RRMM = relapsed/refractory multiple myeloma.

CARVYKTI® (ciltacabtagene autoleucel) Prescribing Information. CARVYKTI® website. Accessed March 31, 2025. <https://www.carvyktihcp.com/safety>.



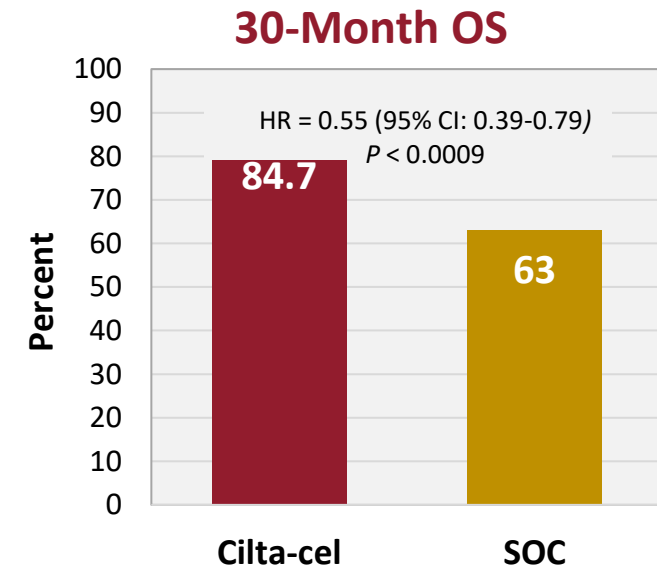
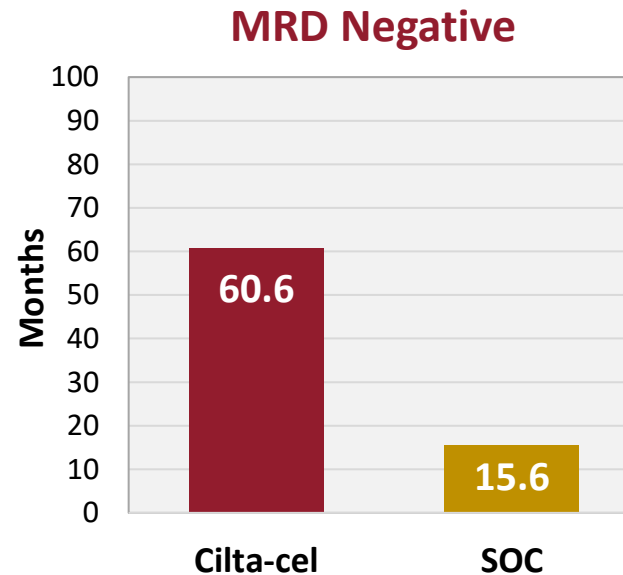
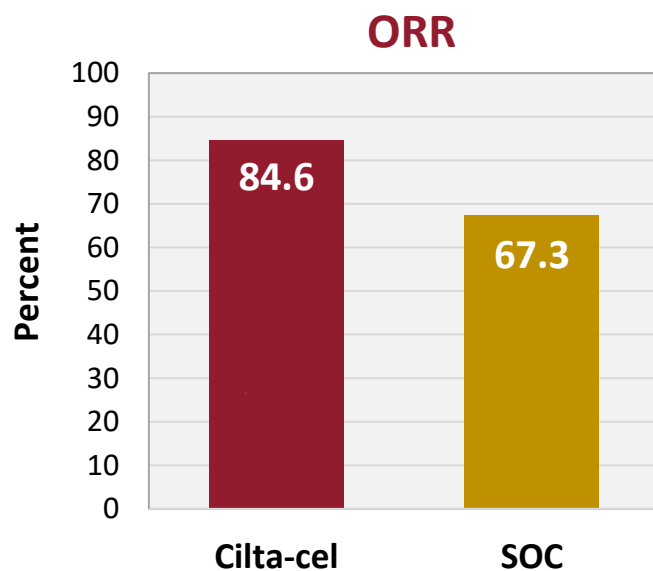
CARTITUDE-4: Cilta-Cel Improved ORR, MRD, and OS vs SOC in Patients With RRMM

- CARTITUDE-4: cilta-cel phase 3 clinical trial
- 419 patients with RRMM (1-3 prior lines of therapy)
 - Cilta-cel n = 208
 - Standard regimen n = 211 (DPd [n = 183] or PVd [n = 28])

Real-world results from US centers key points

- Cilta-cel in RRMM resulted in deep and durable response despite over half of patients not meeting the CARTITUDE-1 eligibility criteria
- Close surveillance for late complications such as second primary malignancies and efforts to mitigate delayed neurotoxicity and nonrelapse mortality are crucial

Results



AE = adverse event; cilta-cel = ciltacabtagene autoleucel; CR = complete response; CRS = cytokine release syndrome; DPd = daratumumab, pomalidomide, dexamethasone; ICANS = immune effector cell-associated neurotoxicity syndrome; MRD = minimal residual disease; OS = overall survival; PFS = progression-free survival; PVd = pomalidomide, bortezomib, dexamethasone; RRMM = relapsed/refractory multiple myeloma; SOC = standard of care.

San-Miguel J, et al. *N Engl J Med*. 2023;389:335-347. Mateos M-V, et al. Presented at: 21st International Myeloma Society (IMS) Annual Meeting; September 25-28, 2024; Rio de Janeiro, Brazil. Sidana S, et al. *Blood*. 2025;145(1):85-97.

CAR T-Cell Therapy AEs

Acute AEs

- Cytokine-release syndrome
- Immune effector cell–associated neurotoxicity syndrome
- Cytopenias
- Hemophagocytic lymphohistiocytosis/macrophage activation syndrome

**TYPICALLY MANAGED BY
CAR T-CELL THERAPY CENTER**

**Nurses are critical
for coordination of care
between CAR T center
and community
center!**

Delayed AEs

- B-cell aplasia/hypogammaglobulinemia
- Prolonged cytopenias
- Long-term neurologic events/movement and neurocognitive treatment-emergent AEs
- Transient cardiac toxicities
- Atypical infections

**TYPICALLY MANAGED BY
PRIMARY ONCOLOGY TEAM**

**How do you help
your patients
transition back to
community care?**

Medications Can Reduce Infection Risk



Some people receiving BCMA-targeting CAR T-cell therapy have experienced infections that are less common, such as CMV, PJP, and fungal infections

Type of Infection Risk	Medication Recommendation(s)
Viral: herpes simplex (HSV/VZV); CMV	Acyclovir prophylaxis
Viral: influenza, COVID-19	Consider antiviral therapy if exposed or positive for influenza or COVID-19, per institution recommendations
Hepatitis B virus (HBV) reactivation	Entecavir prophylaxis in patients positive for chronic HBV infection (defined as serologically positive for hepatitis B surface antigen [HBsAg]) if treated with CAR T-cell therapy , bispecific antibodies, or daratumumab
Bacterial: blood, pneumonia, and urinary tract infection	Consider prophylaxis with levofloxacin
Pneumococcal infection	The Centers for Disease Control and Prevention recommends pneumococcal vaccination (1 dose of PCV20 or 1 dose of PCV15 followed by 1 dose of PPSV23 at least 1 year later); CAR T-cell therapy or ASCT: revaccinate 3 to 6 months after treatment ; bispecific: update vaccination status prior to starting therapy
<i>Pneumocystis jirovecii</i> pneumonia (PJP)	Consider prophylaxis with trimethoprim-sulfamethoxazole
Fungal infections	Consider prophylaxis with fluconazole
IgG < 400 mg/dL (general infection risk)	IVIG replacement (400 mg/kg once every 4 weeks) is indicated; IVIG replacement during CAR T-cell therapy and bispecific antibody therapy is not guided by the presence of infections^a CAR T-cell therapy: day +30 through 1 year. After 1 year continue until serum IgG > 400 mg/dL Bispecific: start at the second cycle of therapy and continue until the end of therapy or serum IgG > 400 mg/dL
Absolute neutrophil count (ANC) < 1000 cells/μL (general infection risk)	Consider GCSF 2 or 3 times/week (or as frequently as needed) to maintain ANC > 1000 cells/μL and treatment dose intensity; CAR T-cell therapy: start oral levofloxacin at 500 mg daily^b or per clinician discretion and continue through neutrophil recovery ; bispecific: consider starting with therapy and administer throughout the first cycle

^aIVIG is indicated in all patients with MM with IgG < 400 mg/dL and recurrent life-threatening infections. ^bAlternatives: cefdinir 300 mg by mouth twice a day or amoxicillin/clavulanate 875 mg by mouth twice a day.

ASCT = autologous stem cell transplant; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CMV = cytomegalovirus; GCSF = granulocyte colony-stimulating factor; HSV = herpes simplex virus;

IgG = immunoglobulin G; IVIG = intravenous immunoglobulin; MM = multiple myeloma; PCV = pneumococcal conjugate vaccine; PPSV = pneumococcal polysaccharide vaccine; VZV = varicella zoster virus.

Raje NS, et al. *Lancet Haematol*. 2022;9(2):143-161. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to [NCCN.org](https://www.nccn.org). Cao W, et al. *Blood*. 2020;136(4):516-519.

ASH-ASTCT Guidelines for Revaccination Following CAR T-Cell Therapy



Clinical Pearl: institution-specific guidelines for revaccination vary

Easy to forget vaccinations at 12 and 18 mo. Automate reminders or other techniques

Killed/Inactivated Vaccines*	Pre-CAR	>3 mo	>6 mo	>6 mo	<8 mo	>10 mo	>12 mo	>18 mo	Interval Between Vaccinations
Influenza†	Flu	Flu							Yearly
RSV†		RSV							ACIP guidance
SARS-CoV†	SARS-CoV-2	SARS-CoV-2							ACIP guidance for immunocompromised patients
Pneumococcus‡			PCV20	Titers	PVC20	PCV20			1-2 months
Diphtheria, tetanus, and acellular pertussis (DTap)§,			DTap	Titers	Td	Td			1-2 months
Hepatitis A¶, #			HAV	Titers			HAV		6 months
Hepatitis B#, **			HAB	Titers	HBV		HAB		2 months
Shingrix††							VZV	VZV	

*For inactivated “dead” virus vaccines, vaccination should be at least 2 months after last dose of IVIG. †If patient is going to receive CAR T-cell therapy during influenza season, administer annual inactivated influenza vaccine after leukapheresis and 2 weeks prior to beginning lymphodepletion chemotherapy (if not previously administered). Subsequent annual vaccinations can resume > 6 months after CAR T-cell therapy. RSV vaccine guidance by ACIP and ASTCT guidelines. ‡Check titers for *Streptococcus pneumoniae* (IgG, 23 serotypes) 1 to 2 months after each PCV20. A positive response to PCV20 is defined as achieving a seroprotective IgG level against *Streptococcus pneumoniae* in 15 out of 20 PCV20 serotypes at 1 to 2 months after vaccination. A positive response requires no further PCV20 vaccination. §Separate component vaccines (shots) may be used instead for DTaP, IPV, and Hib if Pentacel is unavailable. ||Check titers to Hib, tetanus toxoid. ¶If NOT administering hepatitis B series using Heplisav-B, Twinrix can be administered on days when HAV and HBV are given together (Twinrix approved for age ≥ 18 years). #Hepatitis A and B surface antigen IgG. **Hepatitis B vaccination is accomplished preferably with Heplisav-B based on data extrapolated from patients with chronic kidney disease or on hemodialysis for ESRF. Alternatively, double (40 mcg/dose = 2 mL total) doses of Engerix-B may be given. Patients who do not respond to the primary vaccine series should receive an additional 1 to 3 doses of the same vaccine or, alternatively, repeat series with a different vaccine brand (eg, double doses of Engerix-B if no response to Heplisav-B or single dose of Heplisav-B if no response to Engerix-B). ††Not until 1 year after CAR T-cell therapy, 1 year after transplant, 8 months off all systemic immunosuppressive therapy for chronic GVHD, and absolute CD4 T-cell count > 200/μL.

ACIP Advisory Committee on Immunization Practices; ASH = American Society of Hematology; ASTCT = American Society for Transplantation and Cellular Therapy; CAR = chimeric antigen receptor; DTaP = diphtheria tetanus pertussis; GVHD = graft vs host disease; IPV = HAV = hepatitis A virus; HBV = hepatitis B virus; Hib = *Haemophilus influenzae* type b; mo = month; PVC = Pneumococcal conjugate vaccine; Td = tetanus diphtheria; VZV = varicella zoster virus.

Shahid Z, et al. *Transplant Cell Ther.* 2024;30(10):955-969.



Anitocabtagene Autoleucel In Development for RRMM: IMMagine-1 Phase 2 Registrational Study

IMMagine-1 Phase 2 Study

- Pts with RRMM ≥ 3 prior lines (N = 58)
 - Median 4 prior lines (range, 3-8)
 - 69% triple-class refractory; 34% penta-class refractory

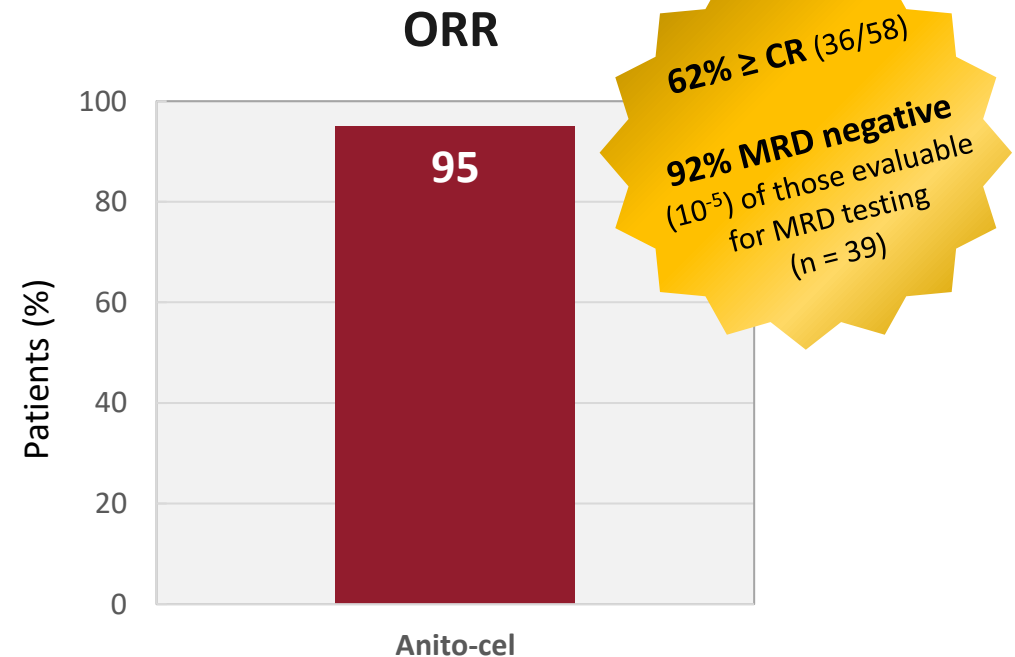
Results

- Median follow up: 10.3 months (range, 2.0-17.8 months)
 - 6-month PFS: 90% (95% CI, 77-96%)
 - 6-month OS: 95% (95% CI, 85-98%)
- Any grade CRS: 84%
 - 16% NO CRS (9/58); 64% Gr1 CRS; 19% Gr2
 - 1 patient Grade 5 CRS
- Any Grade ICANS 9% (5/58)
 - 2 pts Grade 1, 2 pts Gr2, 1 pt Gr3; ALL Resolved
 - 5 days median time to onset (range, 2-7)
 - 6 days median duration (range 1-10)
- **Notably NO delayed neurotoxicity, cranial nerve palsies, Guillain Barre syndrome, or Parkinsonian-like symptoms observed to date**



WATCH FOR

FDA approval
of anito-cel





Selected CAR T-Cell Therapy Clinical Trials in Patients With NDMM



Would CAR-T cell therapy ever be considered as a first-line option?

CARTITUDE-5:

Phase 3

Patients with NDMM, ASCT not planned
VRd → cilta-cel
VRd → Rd

136

locations

STATUS:

Active, not recruiting

KarMMa-9:

Phase 3

patients with NDMM with suboptimal response to ASCT
Ide-cel vs R maintenance

121

locations

STATUS:

Active, not recruiting

CARTITUDE-6:

Phase 3

Patients with NDMM, ASCT eligible
DVRd → cilta-cel
DVRd → ASCT

141

locations

STATUS:

Recruiting

MonumenTAL-8:

Phase 2 high-risk MM

Cohort 2: NDMM ASCT ineligible
DRd → cilta-cel → talquetamab

12

locations

STATUS:

Recruiting



CAR T-Cell Therapies in Early-Stage Development

Dual-Targeting CAR T-Cell Therapy

CARs that target 2 antigens

- Alleviates the antigen evasion of single-target therapy

KQ-2003: a BCMA/CD19 dual-targeting CAR T-cell therapy in phase 1/2

RRMM in patients with 1+ prior therapies

- N = 23
- ORR = 100% (sCR/CR = 88.9%)
- Efficacy in patients with EMD

Allogeneic CAR T-Cell Therapy

“Off-the-shelf” therapy using donor-derived CAR T cells

- Alleviates waiting and uncertainty in auto CAR T-cell engineering

P-BCMA-ALLO1: allogeneic BCMA-targeting CAR-T cell therapy in phase 1/1b

RRMM in patients with 3+ prior therapies

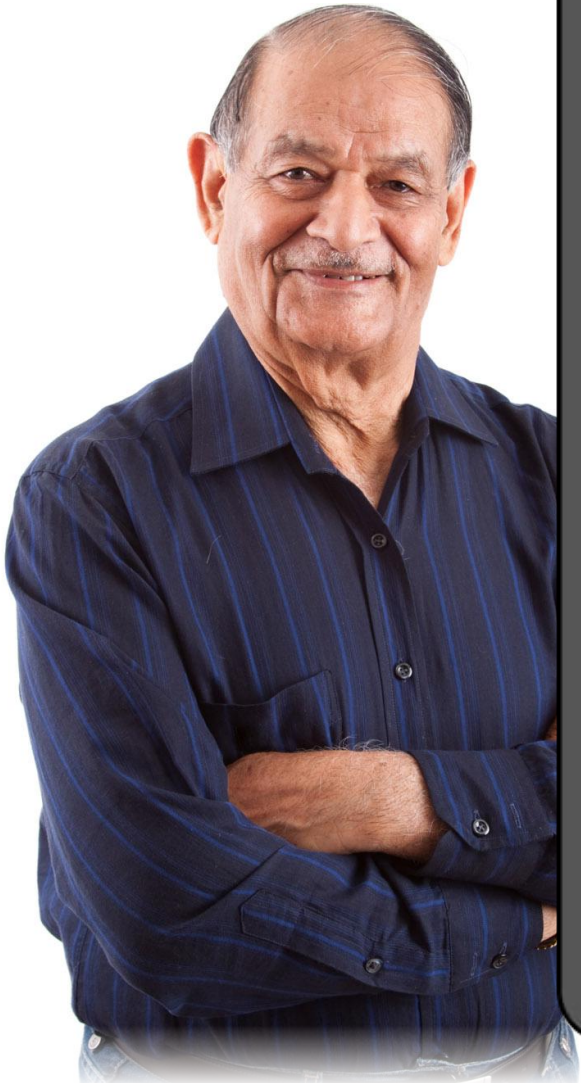
- N = 21
- ORR = 100% in BCMA-naive
- ORR = 83% in patients with prior BCMA treatment

CASE 2



At what point should treatment start?

*HIPAA-compliant,
not actual patient
name, stock photo.



MARCUS*

PATIENT NOTES

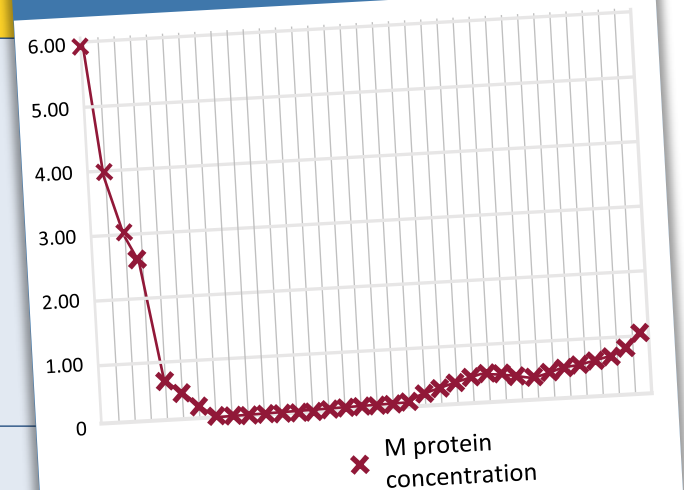
- 68-year-old man diagnosed with MM in 2022
 - High risk: del(17p)
 - Tx plan: RVd → ASCT → maintenance
 - Anti-CD38 added to RVd → ASCT → clinical trial maintenance

June 2024

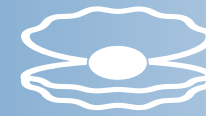
- 70 years old, biochemical relapse
 - Light chains increasing
 - M protein > 25% above the lowest point

LABORATORY RESULTS

Flowsheet Data



CASE 2



Clinical Pearl: Bridging therapy occurs between T-cell harvest and CAR T-cell infusion

*HIPAA-compliant,
not actual patient
name, stock photo.



MARCUS*

PATIENT NOTES

June 2024	<ul style="list-style-type: none">• Shared decision-making → high-risk• Considerations: wanted to start therapy• Started: XVd
July 2024	<ul style="list-style-type: none">• Received CAR T-cell therapy slot
July 2024	<ul style="list-style-type: none">• T cells harvested• Resumed XVd as bridging therapy
September 2024	<ul style="list-style-type: none">• Admitted; lymphodepletion; BCMA-directed CAR T cells infused; grade 2 CRS, cytopenias• Discharged and stayed with daughter near center
December 2024	<ul style="list-style-type: none">• CR

Summary



MM clones evolve over time and can become resistant to therapy.



The **relapse workup for MM** includes laboratory blood work, genetic testing (FISH of bone marrow biopsy), and imaging for bone involvement and/or extramedullary disease.



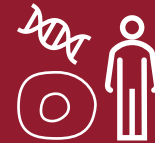
There are **many options** for treating patients with relapsed MM; many considerations for treatment (eg, prior therapies, sequencing, **patient preference**).



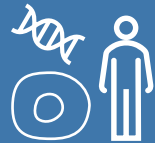
Anticoagulation is important for patients receiving certain myeloma therapies, **including IMiD- or carfilzomib-containing regimens**.



Selinexor is a novel selective nuclear export (SINE) inhibitor. In addition to treating MM, **may not impair T-cell function**, potentially improving the effectiveness of MM therapies that depend on T-cell function.



Cilta-cel and ide-cel are CAR T-cell therapies that are approved after 1 or 2 prior lines of therapy, respectively. Patients must have had at least a proteasome inhibitor and IMiD therapy.



CRS, neurotoxicity, cytopenias, and infection are AEs associated with CAR T-cell therapy. Acute toxicities are managed at the CAR T-cell therapy center; delayed toxicities may be managed by the primary oncology practice.

AE = adverse event; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; cilta-cel = ciltacabtagene autoleucel; CRS = cytokine release syndrome; FISH = fluorescence in situ hybridization; ICANS = immune effector cell-associated neurotoxicity syndrome; IMiD = immunomodulatory drug; ide-cel = idecabtagene vicleucel; MM = multiple myeloma.
Keats JJ, et al. *Blood*. 2012;120(5):1067-1076. Hillengass J, et al. *Lancet Oncol*. 2019;20(6):e302-e312. Ghobrial IM, et al. *Blood*. 2014;124:3380-3388. Rajkumar SV, et al. *Lancet Oncol*. 2014;15:e538-3548.
Faiman B, et al. *J Adv Pract Oncol*. 2016;2016:7(suppl 1):17-29. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to NCCN.org. XPOVIO® (selinexor) Prescribing Information. Binder AF, et al. *Front Immunol*. 2023;14:1275329.
ABECMA® (idecabtagene vicleucel) Prescribing Information. CARVYKTI® (ciltacabtagene autoleucel) Prescribing Information. Brudno JN, Kochenderfer JN. *Blood*. 2016;127(26):3321-3330. Lee DW, et al. *Biol Blood Marrow Transplant*. 2019;25:625-638. Maus MV, et al. *J Immunother Cancer*. 2020;8(2):e001511. Cohen AD. *Blood Cancer J*. 2022;12:32. Chakraborty. *Transplant Cell Ther*. 2021;27:222. Raje NS, et al. *Lancet Haematol*. 2022;9(2):143-161.

International Myeloma Foundation
800-452-CURE (2873)
<http://myeloma.org>

Relapsed Multiple Myeloma: Immunotherapies and Emerging Therapies

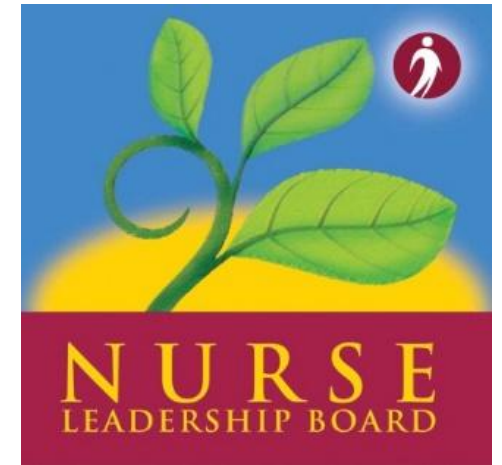
CASE 2: Julio*

CASE 3: Linda*

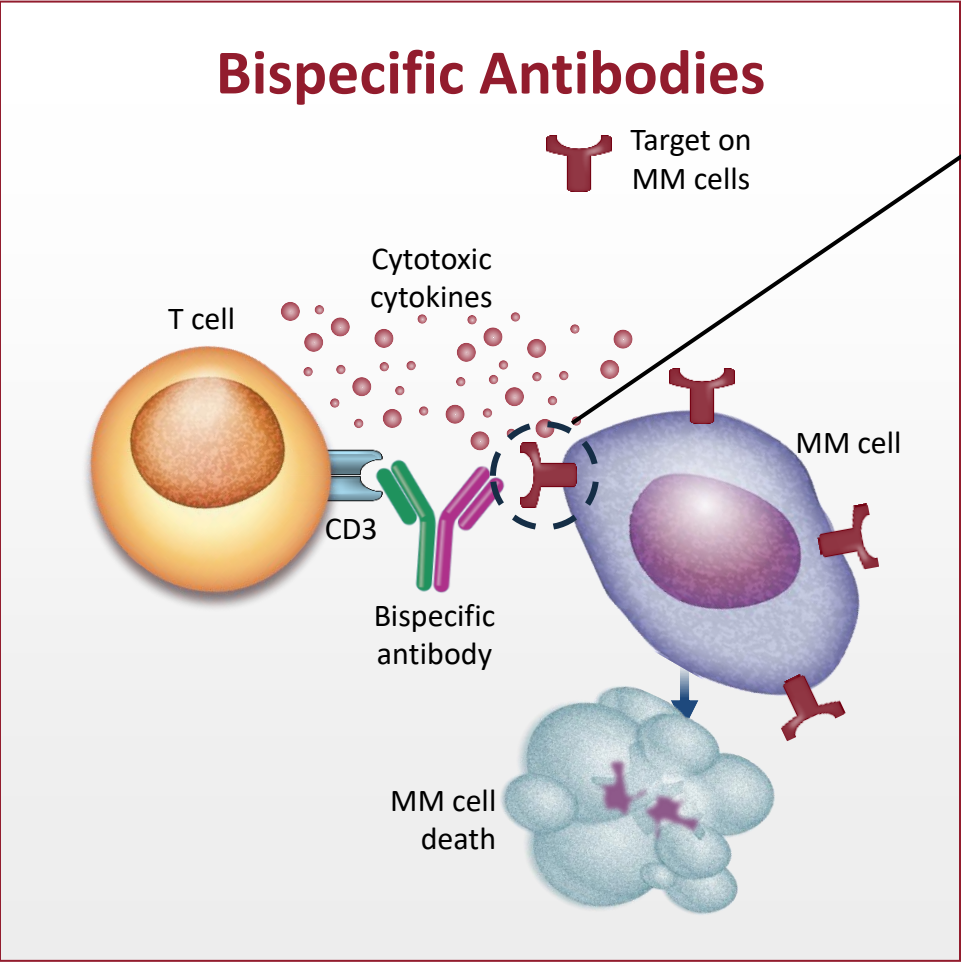
*HIPAA-compliant; not actual patient names.



Mary Steinbach, DNP, APRN



**Beth Faiman, PhD, RN, MSN, APRN-BC, AOCN,
BMTCN, FAAN**



Mechanism of Action for Bispecific Antibodies: T-Cell Immune Activity Triggered Killing of Myeloma Cells



 Target on Myeloma Cells	 Bispecific Antibody	Administration	FDA Approval
BCMA	Teclistamab-cqyv	SC	October 2022
BCMA	Elranatamab-bcmm	SC	August 2023
GPRC5D	Talquetamab-tgvs	SC	August 2023

 Target on Myeloma Cells	 Bispecific Antibody in Development
BCMA	Alnuctamab
	Etentamig (ABBV-383)
	Linvoseltamab
GPRC5D	Forimtamig (RG6234)
FcRH5	Cevostamab

BCMA = B-cell maturation antigen; FcRH5 = Fc receptor-homolog 5; IV = intravenous; FDA = US Food and Drug Administration; GPRC5D = G-protein coupled receptor family C group 5 member D; MM = multiple myeloma; SC = subcutaneous.
O'Neill C, van de Donk NWJ. *EJHaem*. 2023;4(3):811-822. Cho S-F, et al. *Front Oncol*. 2022;12:1032775. TECVAYLI® (teclistamab-cqyv) Prescribing Information. ELREXFIO® (elranatamab-bcmm) Prescribing Information. TALVEY® (talquetamab-tgvs) Prescribing Information.



Patient Eligibility for Bispecific Therapy

Bispecific antibody therapies are appropriate for patients with MM who have received sufficient lines of prior therapy

- ✓ 4 prior lines of therapy, exposure to PI, IMiD, and anti-CD38 antibody
 - Other lines or maintenance in clinical trial
- ✓ Consider the appropriate target based on prior exposure
- ✓ Consider step-up dosing schedule, need for close monitoring
- ✓ Considerations based on organ function
 - May need to dose adjust supportive care drugs
- ✓ No active or serious infections (ie, fungal, bacterial, viral)
- ✓ Sufficient social support
 - Caregiver support
 - Multiple travel and housing support systems

IMiD = immunomodulatory drug; MM = multiple myeloma;
PI = proteasome inhibitor.

Abramson, JS, et al. *Am Soc Clin Oncol Educ Book*. 2019;39:446-453.

Yakoub-Agha I, et al. *Haematologica*. 2020;105(2):297-316.



IMWG Immunotherapy Registry: Real-World Research to Answer Questions About Sequencing MM Therapies



- Real-world data from IMWG-affiliated sites
- Prospectively follows 6000 participants, including “controls”
- Collect risk status, lines of therapy, drug exposure and refractoriness
- Evaluate sequencing of immunotherapies
- Asses global differences in practice patterns
- Analyze treatment response, toxicities, and outcomes

How do you sequence therapies in your institution?

CASE 3

*HIPAA-compliant,
not actual patient
name, stock photo.



Julio*

- Diagnosed with standard-risk MM in 2018 at age 70 years, transplant deferred

PATIENT NOTES

Treatment History

- DRd → R maintenance
- Pomalidomide/bortezomib/dexamethasone
- Carfilzomib/cyclophosphamide/dex
- Selinexor/pomalidomide/dex

January 2024 (76 Years Old)

- Symptomatic relapse (new bone lesions, increasing M protein)
- Considerations: low blood counts
- Discussed treatment options

Before, During, and Throughout Bispecific Therapy

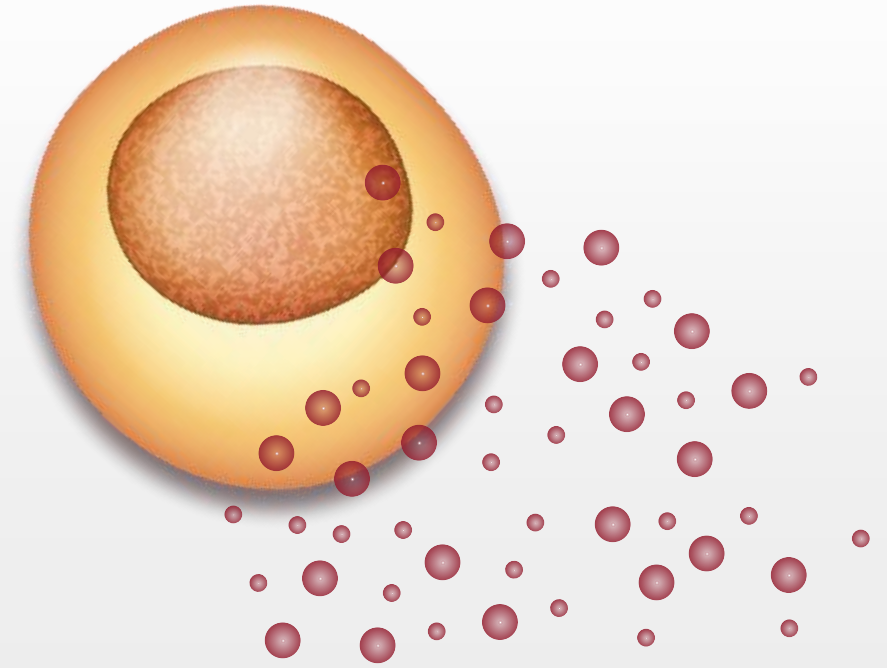
BEFORE

- Plan next therapy
 - Consider bispecific, CAR T-cell therapy, clinical trial, other options
- For bispecific
 - Referral (if needed)
 - Evaluation
- Transition of care needs
- Plan ramp-up dosing
- REMS
- Prophylaxis for infection
- Wallet cards

IMWG Immunotherapy Committee: CRS Important Points for Bispecific Antibodies in MM

- **CRS is a systemic inflammatory reaction** caused by T-cell activation and the release of proinflammatory cytokines
- Bispecific antibodies currently in clinical development for multiple myeloma induce **CRS, which is mostly grade 1 or 2**
- The **frequency of CRS varies for different bispecific antibodies** due to various factors
- Diagnostic investigation of CRS involves a detailed medical history, physical examination, and laboratory investigations
- **Prophylactic use of tocilizumab** has been evaluated to reduce the incidence of CRS
- The **grading and management of CRS** involve different strategies based on the severity of the syndrome

Cytokine release syndrome (CRS)



Example Interventions With Grade 1 CRS Following Bispecific Antibody (Institution Specific)

- Administer tocilizumab 8 mg/kg IV
 - May repeat dose up to 3 times; however, this patient cohort did not require additional doses
- Administer acetaminophen 1000 mg
- Monitor vital signs every 15 minutes until resolution
 - If no improvement in 1 hour, consider administering steroids
- Until ruled out, manage for infection
 - IV antibiotics
- IV fluids for hypotension
 - Consider vasopressors if no resolution (Brudno JN, Kochenderfer JN. *Blood Rev.* 2019;34:45-55)



Order set in place at the time of bispecific administration



Nurses are trained to recognize symptoms



Nurses notify APP or MD, who authorizes release of the orders



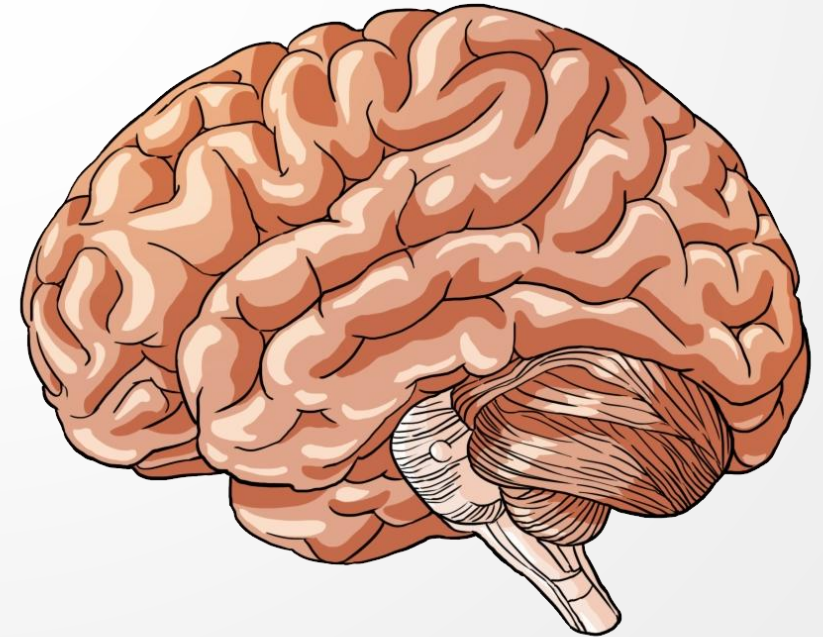
Patients are admitted to the APP service for CRS management

How do you manage CRS in your institution?

IMWG Immunotherapy Committee: Neurologic Important Points for Bispecific Antibodies in MM

- Neurologic complications associated with bispecific antibodies include **headache, ICANS, and peripheral neuropathy**
- The **frequency** of neurological complications in clinical trials **varies for different bispecific antibodies**
- The **evaluation and management** of neurotoxicity involve neurologic examinations, scoring systems, and diagnostic investigations
- **Corticosteroids, particularly dexamethasone**, are the preferred treatment for ICANS
- **Prophylaxis with nonsedating antiepileptic drugs** can be considered
- **Persistent neurotoxicity might require a neurology consultation** and the use of alternative agents
- **Peripheral neuropathy can worsen on therapy** and might require temporary interruption or steroid treatment

Neurotoxicity



What do community nurses need to know about neurotoxicity?

Before, During, and Throughout Bispecific Therapy

BEFORE

- Plan next therapy
 - Consider bispecific, CAR T-cell therapy, clinical trial, other options
- For bispecific
 - Referral (if needed)
 - Evaluation
- Transition of care needs
- Plan ramp-up dosing
- REMS
- Prophylaxis for infection
- Wallet cards

DURING RAMP-UP

- Close monitoring for 48 hours post-dose
 - CRS (watch for fever)
 - Neurotoxicity
 - Cytopenias
 - Infections
 - Liver function labs
 - HLH/MAS (rare but serious)
 - Fatigue
- Other labs per institution protocol

THROUGHOUT

- Microbial prophylaxis
- Continued monitoring for AEs (especially infection)
- Manage dosing schedule adjustments
- IVIG if immunoglobulin G level < 400 mg/dL
- Immunizations
- Disease response and progression monitoring (monthly laboratory testing and imaging)

Medications Can Reduce Infection Risk



Some people receiving BCMA-directed bispecific antibody therapy have experienced infections that are less common, such as CMV, PJP, and fungal infections

Type of Infection Risk	Medication Recommendation(s)
Viral: herpes simplex (HSV/VZV); CMV	Acyclovir prophylaxis
Viral: influenza, COVID-19	Consider antiviral therapy if exposed or positive for influenza or COVID-19, per institution recommendations
Hepatitis B virus (HBV) reactivation	Entecavir prophylaxis in patients positive for chronic HBV infection (defined as serologically positive for hepatitis B surface antigen [HBsAg]) if treated with CAR T cell therapy, bispecific antibodies , or daratumumab
Bacterial: blood, pneumonia, and urinary tract infection	Consider prophylaxis with levofloxacin
Pneumococcal infection	The Centers for Disease Control and Prevention recommends pneumococcal vaccination (1 dose of PCV20 or 1 dose of PCV 15 followed by 1 dose of PPSV23 at least one year later); CAR T cell therapy or ASCT: revaccinate 3-6 months after treatment; Bispecific: Update vaccination status prior to starting therapy
<i>Pneumocystis jirovecii</i> pneumonia (PJP)	Consider prophylaxis with trimethoprim-sulfamethoxazole
Fungal infections	Consider prophylaxis with fluconazole
IgG < 400 mg/dL (general infection risk)	IVIG replacement (400 mg/kg once every 4 weeks) is indicated; IVIG replacement during CAR T-cell and bispecific antibody therapy is not guided by the presence of infections^a CAR T cell therapy: Day +30 through 1 year. After 1 year continue until serum IgG > 400 mg/dL Bispecific: start at the second cycle of therapy and continue until the end of therapy or serum IgG > 400 mg/dL
Absolute neutrophil count (ANC) < 1000 cells/ μ L (general infection risk)	Consider GCSF 2 or 3 times/week (or as frequently as needed) to maintain ANC > 1000 cells/ μ L and treatment dose intensity; CAR-T cell therapy: Start Oral levofloxacin at 500 mg daily ^b or per clinician discretion and continue through neutrophil recovery; Bispecific: consider starting with therapy and administer throughout the first cycle.

^aIVIG is indicated in all patients with MM with IgG < 400 mg/dL and recurrent life-threatening infections. ^bAlternatives: cefdinir 300 mg by mouth twice a day or amoxicillin/clavulanate 875 mg by mouth twice a day.

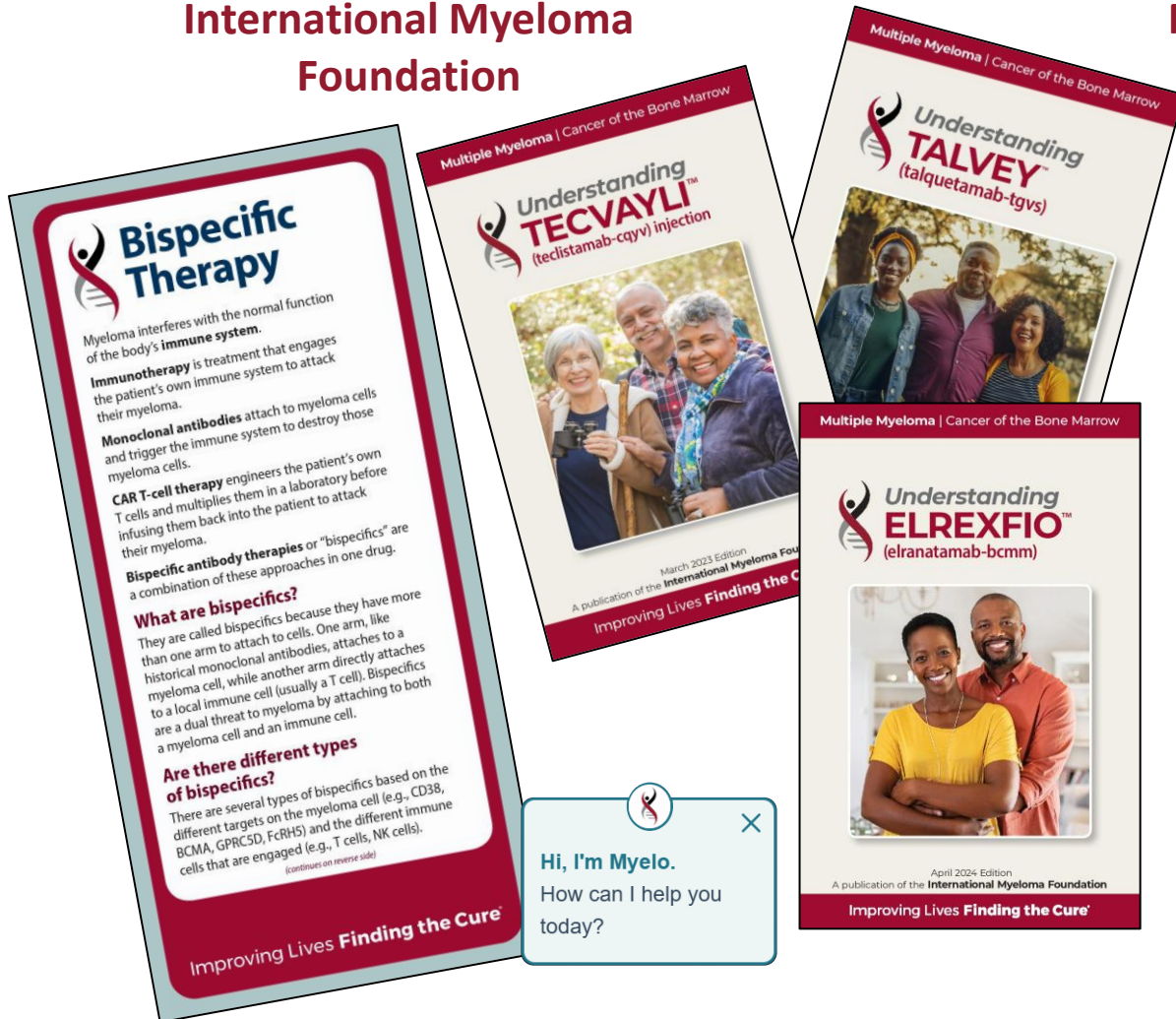
ASCT = autologous stem cell transplant; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CMV = cytomegalovirus; GCSF = granulocyte colony-stimulating factor; HSV = herpes simplex virus;

IgG = immunoglobulin G; IVIG = intravenous immunoglobulin; MM = multiple myeloma; PCV = pneumococcal conjugate vaccine; PPSV = pneumococcal polysaccharide vaccine; VZV = varicella zoster virus.

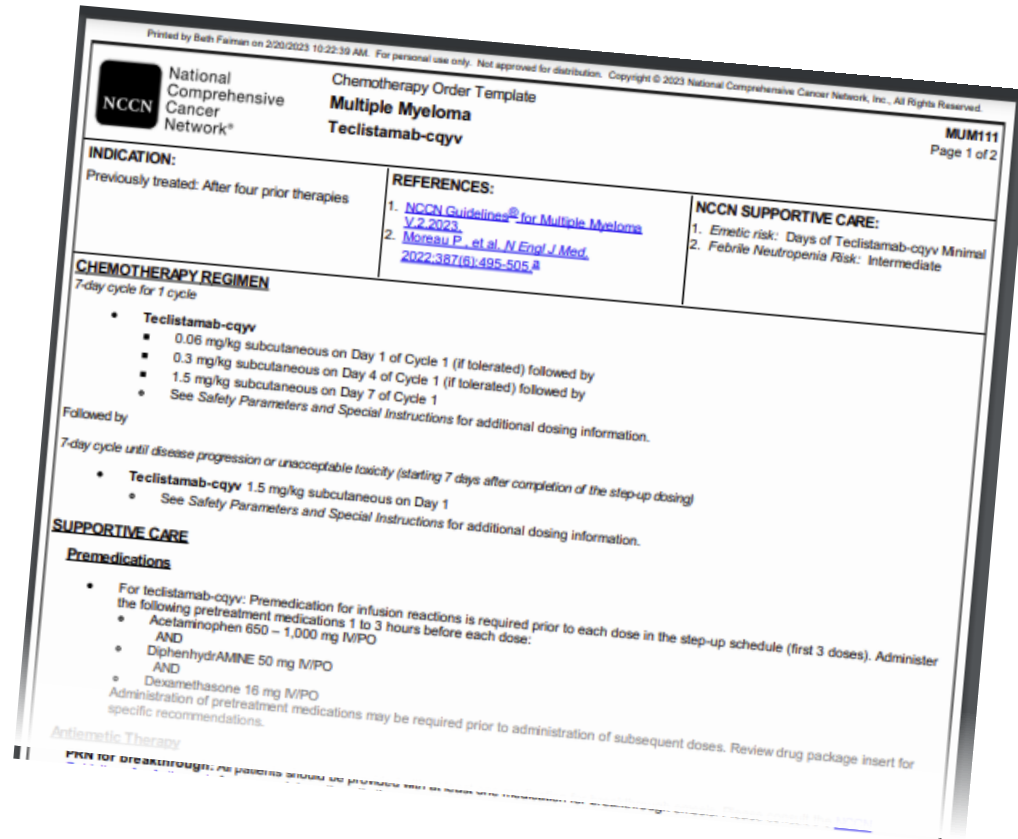
Raje NS, et al. *Lancet Haematol.* 2022;9(2):143-161. National Comprehensive Cancer Network® (NCCN®) NCCN Clinical Practice Guidelines In Oncology (NCCN Guidelines®) for Multiple Myeloma. Version 1.2025. To view the most recent or complete version of the guideline, go online to [NCCN.org](https://www.nccn.org). Cao W, et al. *Blood.* 2020;136(4):516-519.

Resources for Bispecific Antibodies

International Myeloma Foundation



National Comprehensive Cancer Network



Prescribing Information and Drug-Specific Websites



Teclistamab: BCMA-Directed Bispecific Antibody

- Bispecific antibody targeting BCMA
- SC administration
- Step-up dosing → weekly for 6 months → biweekly (every 2 weeks) after 6+ months for patients with a CR or better
- Recommended premedication:
 - Corticosteroid (oral or IV dexamethasone 16 mg)
 - Histamine-1 (H1) receptor antagonist (oral or IV diphenhydramine 50 mg or equivalent)
 - Antipyretics (oral or IV acetaminophen 650 mg to 1000 mg or equivalent)
- Infection prophylaxis
- See prescribing information for dose modifications
 - CRS, neurotoxicity, hematologic AEs, infections, other
 - For restarting after dose delays, may need to repeat step-up dosing

RRMM after
≥ 4 lines of therapy (including a PI,
an IMiD, and an anti-CD38 mAb)

Dosing Schedule	Day	Dose	
Step-Up Dosing Schedule	Day 1	Step-up dose 1	0.06 mg/kg
	Day 4*	Step-up dose 1	0.3 mg/kg
	Day 7*	First treatment dose	1.5 mg/kg
Weekly Dosing Schedule	1 week after first treatment dose and weekly thereafter	Subsequent treatment doses	1.5 mg/kg once weekly
Patients who have achieved and maintained a CR or better for a minimum of 6 months			
Biweekly	The dosing frequency may be decreased to 1.5 mg/kg every 2 weeks		

Many institutions do step-up doses every 48 hours

*May be given between 2 and 4 days after the prior step-up dose and up to 7 days after the prior step-up dose to allow for resolution of AEs.



MajesTEC-1: Teclistamab in Patients With RRMM

MajesTEC-1: Phase 1/2

- N = 165 patients with RRMM with a median of 5 prior lines of therapy (no prior BCMA-directed therapy)
 - 100% triple-class exposed; 77.6% triple-class refractory
 - 70.3% penta-drug exposed; 30.3% penta-drug refractory

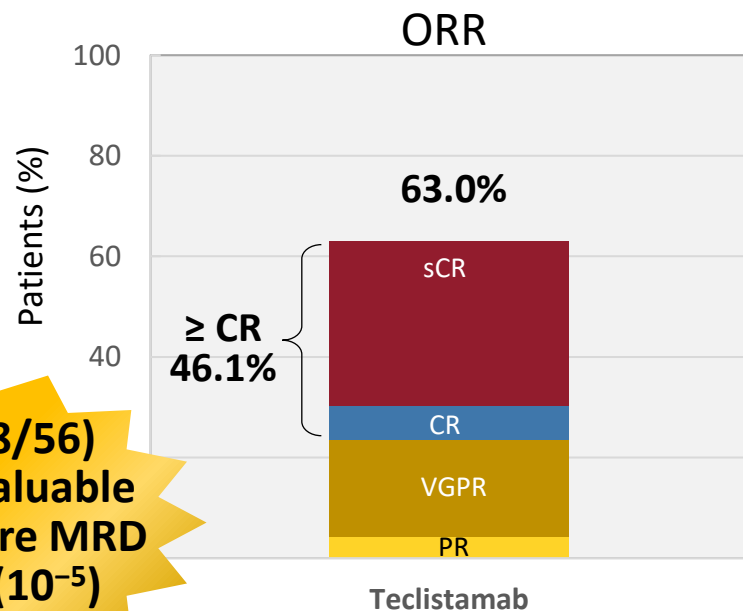


WATCH FOR

Teclistamab for maintenance

MajesTEC-4 phase 3 trial evaluated teclistamab monotherapy or teclistamab with lenalidomide

- **90% to 100% \geq CR** best response on maintenance
- **100% MRD negative (10^{-5})** by 6 or 12 months



**85.7% (48/56)
of MRD-evaluable
patients were MRD
negative (10^{-5})**

- Median PFS: 11.4 months
- Median OS: 22.2 months
- Median DOR: 24.0 months
- Notable AEs:
 - 76.4% infection (grade 3 or 4, 44.8%)
 - 72.1% CRS (grade 3, 0.6%; no grade 4)
 - 70.9% neutropenia (grade 3 or 4, 64.2%)
 - 52.1% anemia (grade 3 or 4, 37.0%)
 - 40% thrombocytopenia (grade 3 or 4, 21.2%)
 - 14.5% neurotoxic events (occurred in 24 patients, including ICANS in 5 patients [3.0%; all grade 1 or 2])

AE = adverse event; BCMA = B-cell maturation antigen; CR = complete response; CRS = cytokine release syndrome; DOR = duration of response; ICANS = immune effector cell-associated neurotoxicity syndrome; MRD = minimal residual disease; ORR = overall response rate; OS = overall survival; PFS = progression-free survival; PR = partial response; RRMM = relapsed/refractory multiple myeloma; sCR = stringent complete response; VGPR = very good partial response.

Garfall AL, et al. ASH 2024. Abstr #7540. Moreau P, et al. *N Engl J Med*. 2022;387(6):495-505. Zamangi E, et al. ASH 2024. Abstr #494.



Elranatamab: BCMA-Directed Bispecific Approved for MM

- Bispecific antibody targeting BCMA
- SC administration
- Step-up dosing → weekly (for 24+ weeks) → biweekly (every 2 weeks) after 25 weeks for responders
- Recommended premedication:
 - Acetaminophen (or equivalent) 650 mg orally
 - Dexamethasone (or equivalent) 20 mg orally or IV
 - Diphenhydramine (or equivalent) 25 mg orally
- See prescribing information for dose modifications
 - For CRS, neurotoxicity, hematologic AEs, infections, other
 - For restarting after dose delays (may need to repeat step-up dosing)

RRMM after
≥ 4 lines of therapy (including a PI, an
IMiD, and an anti-CD38 mAb)

Dosing Schedule	Day	Dose	
Step-Up Dosing Schedule	Day 1	Step-up dose 1	12 mg
	Day 4	Step-up dose 2	32 mg
	Day 8	First treatment dose	76 mg
Weekly Dosing Schedule	1 week after first treatment dose and weekly thereafter, through week 24	Subsequent treatment doses	76 mg 1× weekly
Biweekly (Every 2 Weeks) for Responders	Week 25 and every 2 weeks thereafter	Subsequent treatment doses	76 mg every 2 weeks

Institutions may have their own step-up protocols



MagnetisMM-3: Elranatamab in Patients With RRMM

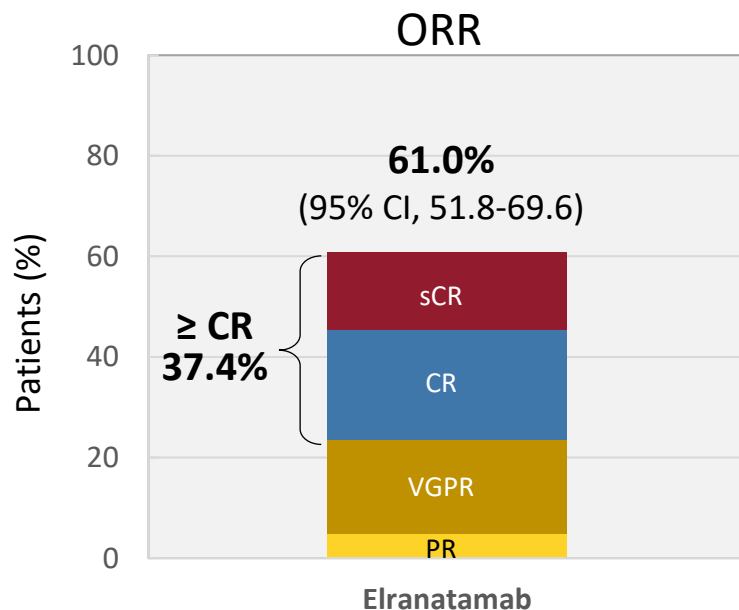
MagnetisMM-3 Phase 2

- N = 123 patients with RRMM with a median of 5 prior lines of therapy (no prior BCMA-directed therapy)
 - 100% triple-class exposed; 96.7% triple-class refractory
 - 70.7% penta-drug exposed; 42.3% penta-drug refractory
- 18.7% (23/123) patients remained on elranatamab at data cutoff (March 26, 2024)



WATCH FOR

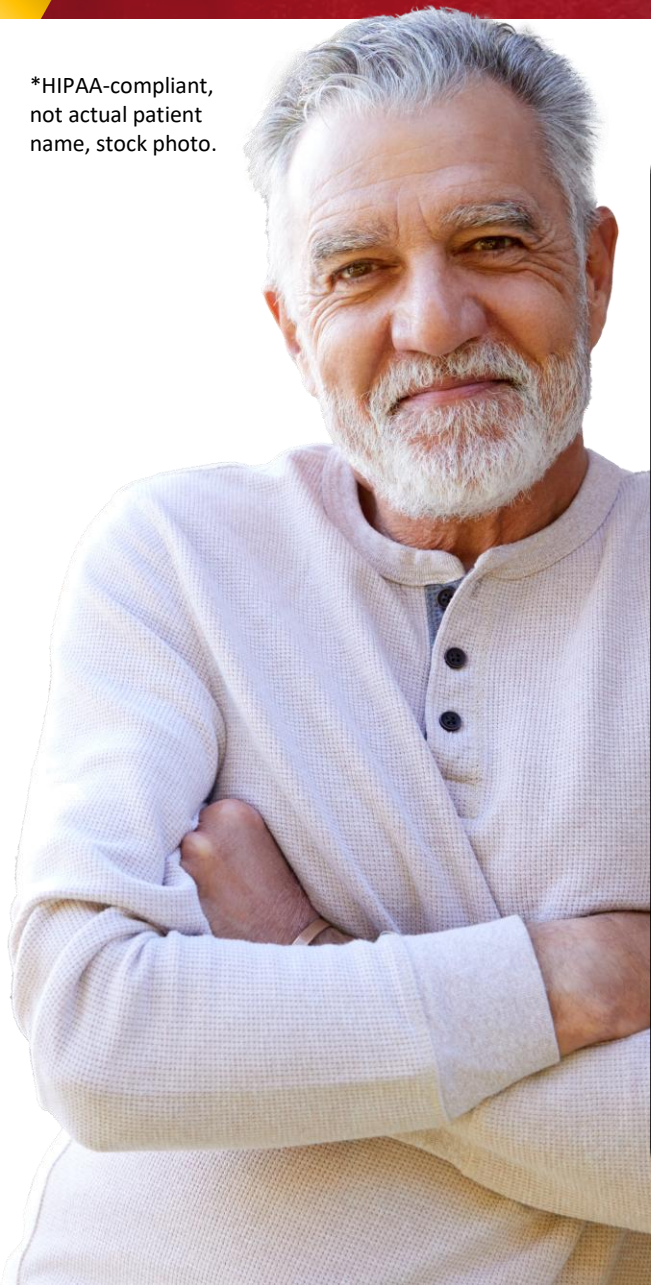
Optimized dosing schedules for elranatamab



- Median PFS: 7.2 (95% CI, 9.8-NE) months
- Median OS: 4.6 (95% CI, 13.4-NE) months
- Median DOR not reached (median follow-up, 28.4 months)
 - 58 patients switched to Q2W dosing; median time on Q2W regimen, 13.4 months (range, 0.03-22)
 - 27 patients further decreased to Q4W; median time on Q4W regimen, 6.5 months (range, 0.03-10.1); 92.0% maintained response ≥ 6 months after switch
- Most frequent AEs by organ class: infection, hematologic disorders, respiratory disorders, gastrointestinal disorders
- Real-world retrospective cohort study: patients who received ELRA exhibited significantly longer PFS, DOR, and OS compared with SOC

CASE 3

*HIPAA-compliant,
not actual patient
name, stock photo.



Julio*

- Man, diagnosed with standard-risk MM in 2018 at age 70 years; transplant deferred

PATIENT NOTES

January 2024 (76 Years Old)	<ul style="list-style-type: none">• Symptomatic relapse• Shared decision-making: BCMA-directed bispecific• Ramp up doses at Huntsman
February 2024	<ul style="list-style-type: none">• Returned to his local oncology practice• VGPR
February 2025	<ul style="list-style-type: none">• Still responding to therapy• CR

BCMA = B-cell maturation antigen; CR = complete response; HIPAA = Health Insurance Portability and Accountability Act; MM = multiple myeloma; VGPR = very good partial response.

Care Transitions

Use a structured handoff process that may include verbal communication, written instructions, and patient/caregiver involvement for effective care transitions

TASK	RESPONSIBLE TEAM (PROVIDER)
Care coordination	Cellular therapy center and community oncology team (RN or APP)
Send referral to cellular therapy center	Community oncology team (RN or APP)
Send past treatment history and responses	Community oncology team (RN or APP)
Coordination of appointment	Cellular therapy center (RN) and community oncology team (RN)
REMS certification by community oncology team	Community oncology team (medical doctor and/or APP)
Patient education regarding treatment	Cellular therapy center (RN, APP, or medical doctor) and community oncology team (RN or APP)
Communicate status of financial clearance to patient and community oncology team	Cellular therapy center (RN)

CASE

Linda*

PATIENT NOTES

Diagnosed in 2023 at 57 years old with triple hit t(14;16) del(17p), 1q21 MM

Treatment History

DRVd—progression
mCAD × 2 with stem cell collection—CR
Elo KPd—progression after 8 months
BCMA CAR T-cell therapy—progression after 12 months

October 2024

- Symptomatic relapse (plasmacytoma, bone pain)
- Discussion: treatment options

*HIPAA-compliant,
not actual patient
name, stock photo.





Talquetamab: GPRC5D-Directed Bispecific Antibody

- **Different target: GPRC5D**, which has limited expression in normal human tissue but is highly expressed on malignant plasma cells
- SC administration
- Dosing based on body weight; step up dosing to start
 - Weekly 0.4 mg/kg (doses at least 6 days apart) OR
 - Biweekly (every 2 weeks) 0.8 mg/kg (at least 12 days apart)
- Recommended premedication:
 - Corticosteroid (oral or intravenous dexamethasone, 16 mg or equivalent)
 - Antihistamines (oral or intravenous diphenhydramine, 50 mg or equivalent)
 - Antipyretics (oral or intravenous acetaminophen, 650 mg to 1000 mg or equivalent)
- See prescribing information for dose modifications
 - For oral toxicity/weight loss, infections, cytopenias, skin reactions, other
 - For restarting after dose delays (may need to repeat step-up dosing)

RRMM after
≥ 4 lines of therapy (including a PI, an
IMiD, and an anti-CD38 mAb)

Dosing Schedule	Day	Dose	
Step-Up Dosing	Day 1	Step-up dose 1	0.01 mg/kg
	Day 4*	Step-up dose 2	0.06 mg/kg
First Weekly Treatment Dose OR Step-Up Dose for Biweekly	Day 7*	Weekly: first treatment dose Biweekly: step-up dose 3*	0.4 mg/kg
First Biweekly Dose	Day 10* (only for biweekly dosing)	Biweekly: first treatment dose	0.8 mg/kg

Many institutions do step-up doses every 48 hours

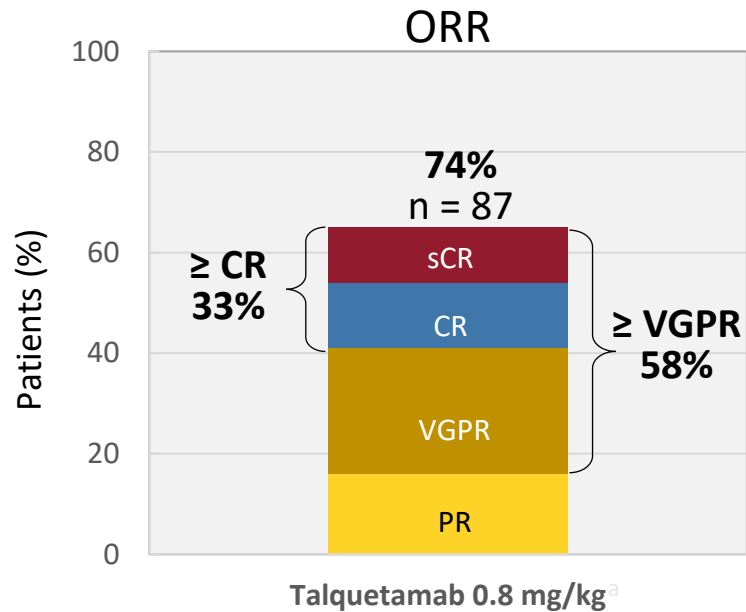
*May be given 2 to 4 days after the prior step-up dose and up to 7 days after the prior step-up dose to allow for resolution of AEs.



MonumenTAL-1: Talquetamab in Patients With RR MM

MonumenTAL-1: Phase 1/2

- Patients with RRMM received talquetamab IV or SC 0.4 mg/kg weekly (n = 143) OR 0.8 mg/kg (n = 154) biweekly
- At least 3 prior lines of therapy (median ≈ 6 prior lines of therapy [range 2-20]); some with prior BCMA-directed bispecific or CAR T-cell therapy (n = 78)
- Triple-class: 99% exposed, 97% refractory; penta-drug: 77% exposed, 25% refractory



- Median time to first response 1.2 to 1.3 months
- Most GPRC5D-related AEs trended toward improvement or resolution, except for weight loss

In patients with prior T-cell redirection therapy (n = 78)

- 67% ORR (42% ≥ CR)
- 56% 12-month DOR
- 44% 12-month PFS
- AEs: 73% CRS, 76% dysgeusia, 64% non-rash skin AEs, 59% nail AEs, 41% rash AEs, 39% weight loss ≥ 10%, 27% anemia grade 3/4, 47% neutropenia, 77% infections, 26% grade 3/4 infections

Skin, nail, and taste changes were AEs associated with targeting GPRC5D

^aORR was similar for 0.4 mg/kg weekly dose, at 70% (2/30).

AE = adverse event; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CR = complete response; CRS = cytokine release syndrome; DOR = duration of response; GPRC5D = G-protein coupled receptor class C group 5 member D; ICANS = immune effector cell-associated neurotoxicity syndrome; IV = intravenous; MM = multiple myeloma; ORR = overall response rate; PFS = progression-free survival; PR = partial response; RRMM = relapsed/refractory multiple myeloma; SC = subcutaneous; sCR = stringent complete response; VGPR = very good partial response.

Rasche L, et al. EHA 2024. Abstr #P915. TALVEY® (talquetamab-tgvs) Prescribing Information. Chari A, et al. *N Engl J Med*. 2022;387(24):2232-2244. Chari A, et al. ASH 2023. Abstr #1010.



TRIMM-2 Clinical Trial: Talquetamab + Daratumumab + Pomalidomide in RRMM

Phase 1b

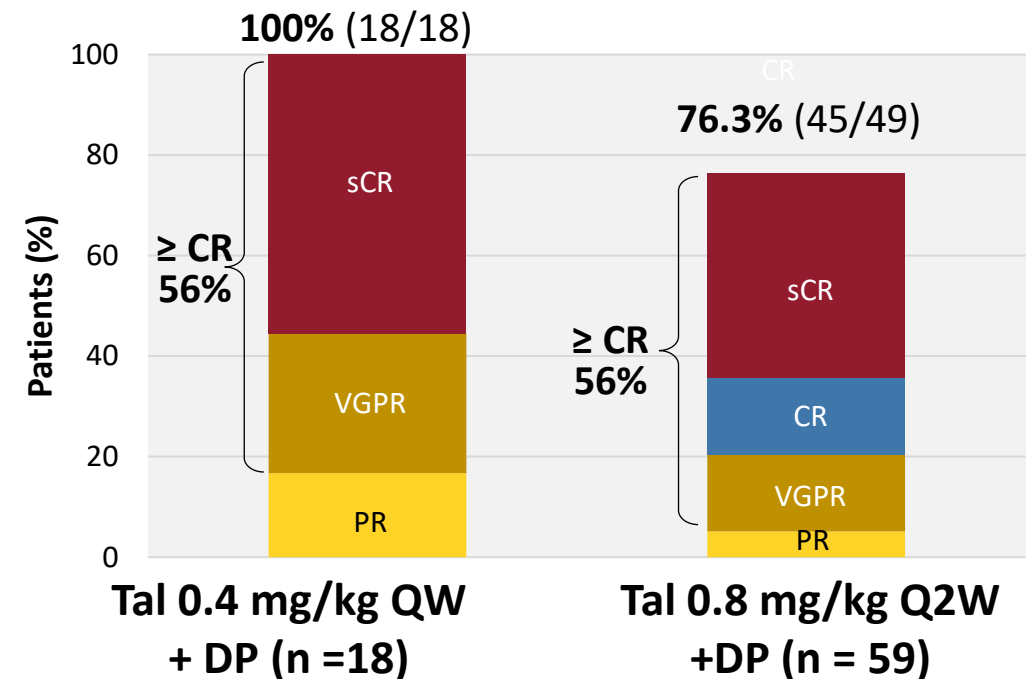
- Patients with RRMM ≥ 3 lines of therapy or refractory to PI and IMiD
- Talquetamab + daratumumab + pomalidomide
 - Talquetamab dosing: 0.4 mg/kg QW OR 0.8 mg/kg Q2W may change schedule from QW to Q2W after cycle 4 if in PR and from Q2W to Q4W after cycle 8 if in VGPR)

Results

ORR (all doses)	81.8%
\geq CR (all doses)	53.2%
mDOR	22.1 mo (95% CI, 13.6-27.0)
mTFR	1.0 mo (range: 0.9-6.7)
mPFS	15.5 mo (95% CI, 11.7-24.4)

- Hematologic AEs consistent with addition of DP to talquetamab
- Grade 3/4 infection rate generally low despite neutropenia being common
- Nonhematologic AEs consistent with profile of individual agents

ORR



AE = adverse event; CR = complete response; DP = daratumumab, pomalidomide; IMiD = immunomodulatory drug; mDOR = median duration of response; mo = months; mPFS = median progression-free survival; mTFR = median treatment-free remission; ORR = overall response rate; PI = proteasome inhibitor; QW = weekly; Q2W = every 2 weeks; Q4W = every 4 weeks; RRMM = relapsed/refractory multiple myeloma; sCR = stringent complete response; VGPR = very good partial response.

Bahlis N, et al. IMS 2024. Abstr #OA-01.



Teclistamab + Talquetamab Combination in Development

Study Design: Phase 1b/2 (N = 94)

- Recommended phase 2 dosing: Tec 3.0 mg/kg Q2W + Tal 0.8 mg/kg Q2W (n = 44)
 - All had exposure to PI, IMiD, anti-CD38 mAb
 - 41% with extramedullary disease
 - 42% high risk

Results

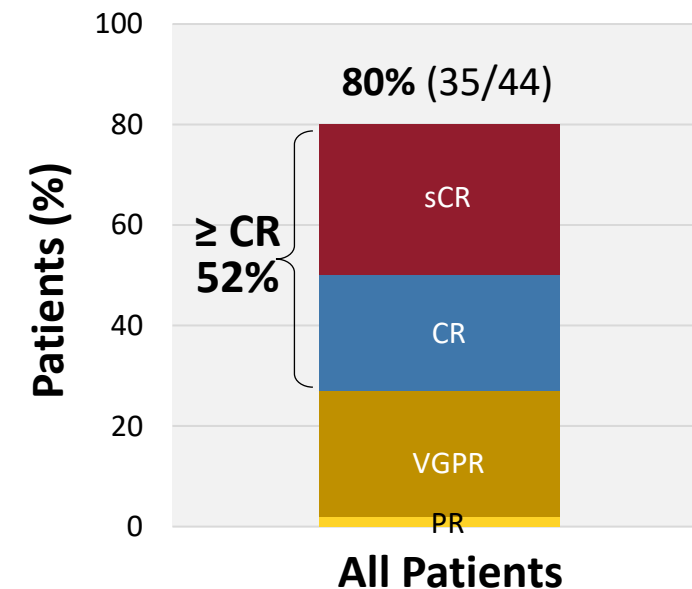
- Median follow-up: 20.3 months (range, 0.5-37.1)
- Durable responses (recommended phase 2 dosing)
 - 12 months: 91% (95% CI, 75-97)
 - 18 months: 86% (95% CI, 66-95)
- Similar profile safety profile to each monotherapy
- Higher rate of infections than with either drug alone
 - Grade 3/4 infections: 64% across all dose levels
 - 11 deaths due to infection across all dose levels
 - Neutropenia: 73% any-grade neutropenia (68% grade 3/4)
 - IVIG when serum IgG < 400 mg/dL
- Extramedullary disease: 61% ORR; 82% with durable response at 18 months



WATCH FOR

New combination regimens with bispecific antibodies in clinical trials

ORR in Patients Treated With Tec 3.0 mg/kg Q2W + Tal 0.8 mg/kg Q2W



AE = adverse event; CR = complete response; CRS = cytokine release syndrome; ICANS = immune effector cell-associated neurotoxicity syndrome; IgG = immunoglobulin G; IMiD = immunomodulatory drug; IVIG = intravenous immunoglobulin; mAb = monoclonal antibody; ORR = overall response rate; PI = proteasome inhibitor; PR = partial response; Q2W = every 2 weeks; sCR = stringent complete response; Tal = talquetamab; Tec = teclistamab; VGPR = very good partial response.

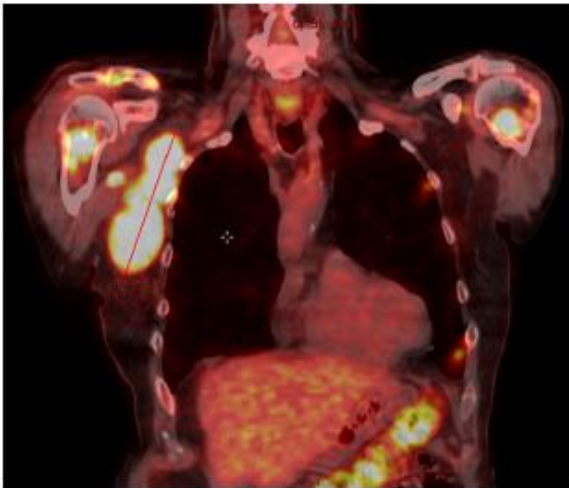
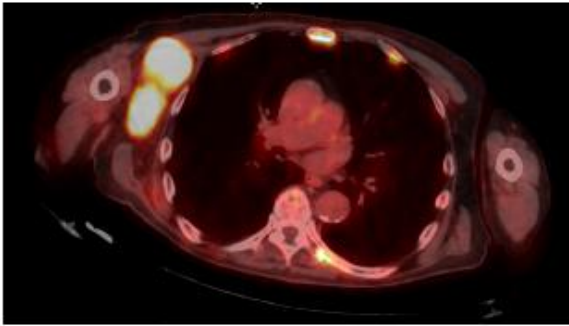
Cohen YC, et al. *N Engl J Med*. 2025;392(2):138-149. Mateos M-V, et al. EHA 2023. Abstr #S190. RedirecTT-1 (MMY1003) Study - TECVAYLI and TALVEY Cohort. Accessed April 5, 2025.

<https://www.janssenscience.com/products/talvey/medical-content/redirecTT1-mmy1003-study-tecvayli-and-talvey-cohort>.

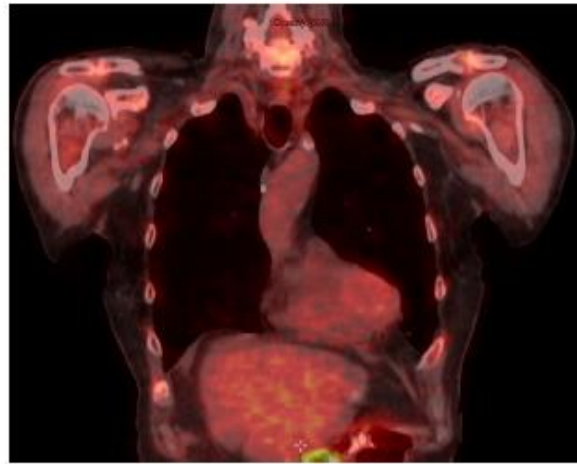
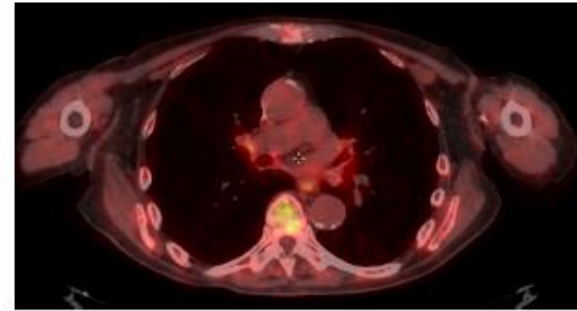
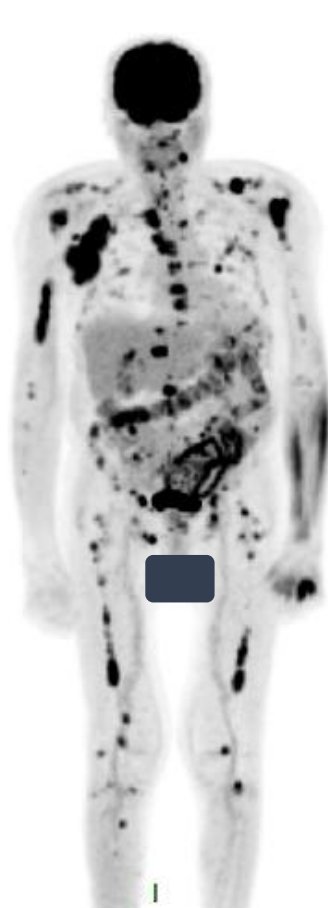


Case Study: Teclistamab + Talquetamab Combination in Clinical Trial

- 74-year-old male, penta refractory, 6 prior LOT including ASCT, belantamab mafodotin, and prior RT to humerus



October 25, 2021



January 2022



Management of Oral Toxicities



Clinical Pearl: If patients are not tolerating due to oral toxicities, use a low threshold for dose reduction or dosing interval change

Taste Changes

Dexamethasone oral solutions “swish and spit” have been tried but with no proven benefit yet. Sour citrus or candies before meals are recommended.

Dry Mouth

OTC dry mouth rinse, gel, spray are recommended. Advise patients to avoid hot beverages.

Dysphagia

Dietary modifications, including taking small bites, eating upright, and sips of beverage with food, can help manage symptoms.

Glossitis and Thrush

EARLY initiation of nystatin or clotrimazole is key to managing symptoms.

- **Weight loss and anorexia** are associated with taste changes. **Nutritionist** involvement and dietary modifications are recommended to support patients. An appetite stimulant with dronabinol, if indicated, can also be utilized
- **Education and emotional support are key strategies for managing oral toxicities**

OTC = over the counter.

Catamero D, et al. *Semin Oncol Nurs*. 2024;40(5):151712. Catamero D, et al. Presented at: 20th International Myeloma Society (IMS) Annual Meeting Nurse Symposium; September 27-30, 2023; Athens, Greece.

Chari A, et al. ASH 2023. Abstr #1010.

Examples of Skin/Nail AEs With Talquetamab



Management of Dermatologic AEs



Clinical Pearl: Dermatologic AEs can be difficult to manage; dose adjustment may be needed

Dry Skin

Heavy moisturizers

Pruritus

Loratadine 10 mg by mouth daily for 3 to 5 days after talquetamab dose and triamcinolone 0.1% cream twice daily

Hand and/or Foot Peeling

Ammonium lactate 12% lotion to soles and palms twice daily

Injection Site Reaction

Nail Thinning and Peeling

Nail hardeners, topical vitamin E oil, and triamcinolone 0.025% ointment

Body Rash/ Drug Rash

Above, plus consider methylprednisolone taper and betamethasone 0.05% cream twice daily

- Consider dose HOLD for other grade 3 dermatologic AEs
- Dermatology consults may be helpful as an early strategy
- **With experience, dermatologic AEs can be managed more easily than oral AEs**
- These interventions were successful at reducing or resolving dermatologic AEs

CASE 2 Continued

Linda*

PATIENT NOTES

Diagnosed in 2023 at 57 years old with triple hit t(14;16) del(17p), 1q21 MM

Treatment History	DRVd—progression mCAD × 2 with stem cell collection—CR Elo KPd—progression after 8 months BCMA CAR T-cell therapy—progression after 12 months
October 2024	<ul style="list-style-type: none">• Symptomatic relapse (plasmacytoma, bone pain)• Referral to Huntsman• Shared decision-making → talquetamab
Ramp-Up Doses	<ul style="list-style-type: none">• Huntsman: ramp-up doses in October-November 2025
Community	<ul style="list-style-type: none">• Community: REMS certification complete November 2024• Mild to moderate skin, nail AEs: OTC nail hardeners, lotion• Response February 2025: VGPR



*HIPAA-compliant,
not actual patient
name, stock photo.

Clinical Trials: The Reason We Have So Many Therapies for MM

Preclinical

ANIMAL STUDIES: Examine safety and potential for efficacy

PHASE 1

FIRST INTRODUCTION OF AN INVESTIGATIONAL DRUG INTO HUMANS

- Determine metabolism and PK/PD actions, MTD, and DLT
- Identify AEs
- Gain early evidence of efficacy, studied in many conditions; typically, 20 to 80 patients; everyone gets agent

PHASE 2

EVALUATION OF EFFECTIVENESS IN A CERTAIN TUMOR TYPE

- Determine short-term AEs and risks; closely monitored
- Includes up to 100 patients, typically

PHASE 3

GATHER ADDITIONAL EFFECTIVENESS AND SAFETY INFORMATION COMPARED TO STANDARD OF CARE

- Placebo may be involved if no standard of care exists; hundreds to several thousand patients
- Often multiple institutions; single or double blind; sometimes open label

PHASE 4

APPROVED AGENTS IN NEW POPULATIONS OR NEW DOSE FORMS

Clinical Trial Myths: Dispelling Inaccuracies Is Important



MYTH: If I participate in a clinical trial, I might get a placebo, not active treatment

MYTH: If I participate in a clinical trial, I can't change my mind

- Phase 1 and 2, everyone gets active treatment
- Phase 3 standard of care vs new regimen: often standard regimen with/without additional agent in MM trials
- Patients can withdraw their consent for clinical trial participation at any time



MYTH: Patients (whatever demographic/distance from clinic/etc) never participate in clinical trials so I won't mention it

- Mention the option and give the patient the opportunity; implicit and explicit biases can limit participation
- Some groups may need more information about clinical trials to feel comfortable with participation



MYTH: Clinical trials are dangerous because they have new medicines and practices

- Some risk is involved with every treatment, but medicines are used in clinical trials with people only after they have gone through testing to indicate that the drug is likely to be safe and effective for human use



MYTH: Clinical trials are expensive and not covered by insurance

- Research costs are typically covered by the sponsoring company
- Standard patient care costs are typically covered by insurance/Medicare
- Check with clinical trial team/insurers; costs such as transportation, hotel, etc may not be reimbursed and are paid by the patient



Etentamig (ABBV-383): BCMA-Directed Bispecific Antibody With Monthly Dosing in Development for MM

NOW
RECRUITING

CERVINO: Phase 3, multicenter, randomized, open-label clinical trial (NCT06158841)

- Enrolling patients with 2+ prior lines of therapy, including a PI, IMiD, and anti-CD38 antibody
- Patients randomized to receive:
 - Etentamig (ABBV-383) 60 mg Q4W OR
 - SOC: investigator choice of Ekd, Pd, or XVd
- 140 sites worldwide with **40 sites in US**

Phase 1b: Results

- Patients with 3+ prior lines, including a PI, IMiD, and anti-CD38 monoclonal antibody (N = 70)
- 1 step-up dose then full dose of 60 mg
- CRS grade ≥ 2 : 12% with 2 mg step-up dose
- ORR: 62%

Etentamig (ABBV-383)

- Fully human bispecific antibody
- Monthly dosing

Bivalent BCMA domain allowing for high BCMA-avidity



Low-affinity CD3 binding domain designed to decrease CRS

Silenced Fc tail designed for an extended half-life

BCMA = B-cell maturation antigen; CRS = cytokine release syndrome; Ekd = elotuzumab, carfilzomib, dexamethasone; Fc = fragment crystallizable; IMiD = immunomodulatory drug; MM = multiple myeloma; ORR = overall response rate; Pd = pomalidomide, dexamethasone; PI = proteasome inhibitor; Q4W = every 4 weeks; SOC = standard of care; TEAE = treatment-emergent adverse event; XVd = selinexor, bortezomib, dexamethasone.

Mian H, et al. ASH 2024. Abstr #1985. Abbvie. AbbVie advances oncology pipeline with start of multiple myeloma phase 3 clinical trial for investigational asset ABBV-383. Press release. AbbVie. June 5, 2024.

Accessed April 5, 2025. [AbbVie Advances Oncology Pipeline With Start of Multiple Myeloma Phase 3 Clinical Trial for Investigational Asset ABBV-383 - Jun 5, 2024.](#)

Linvoseltamab: BCMA-Directed Bispecific Antibody in Development for MM



WATCH FOR
FDA approval decision of
Linvoseltamab expected this year

LINKER-MM1: Phase 1/2

- Patients with RRMM ≥ 3 lines of therapy N =117
- 200 mg IV linvoseltamab

Results and conclusions

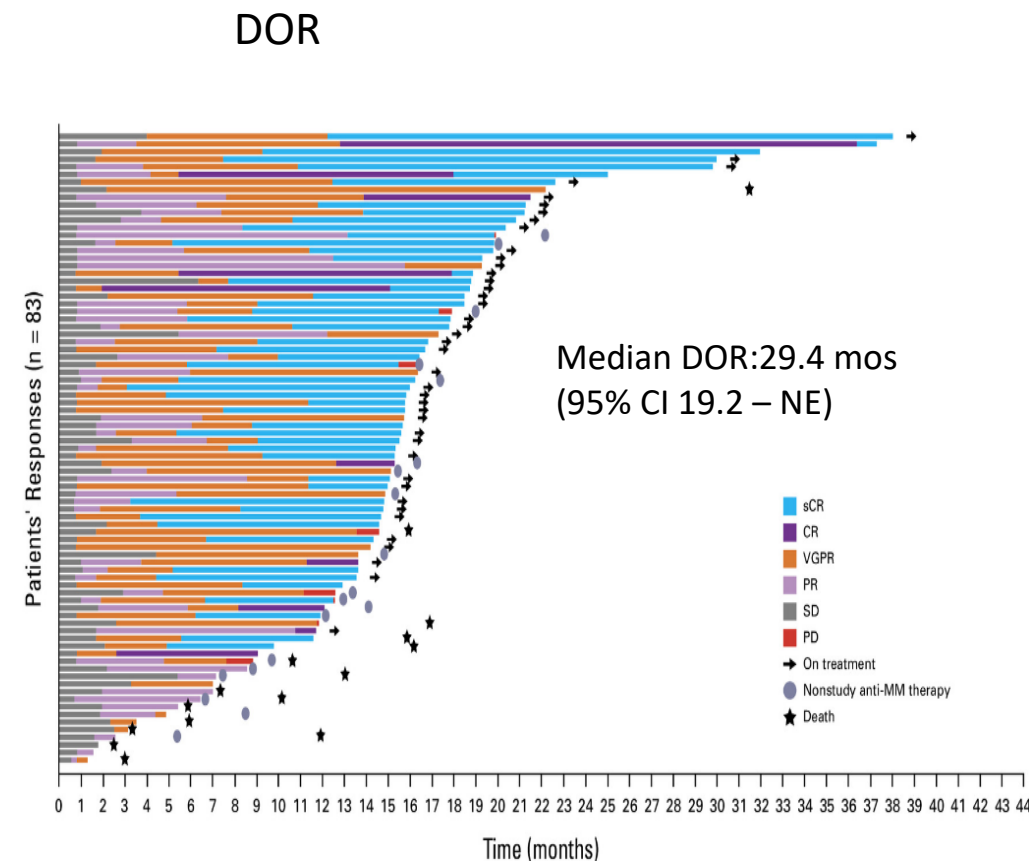
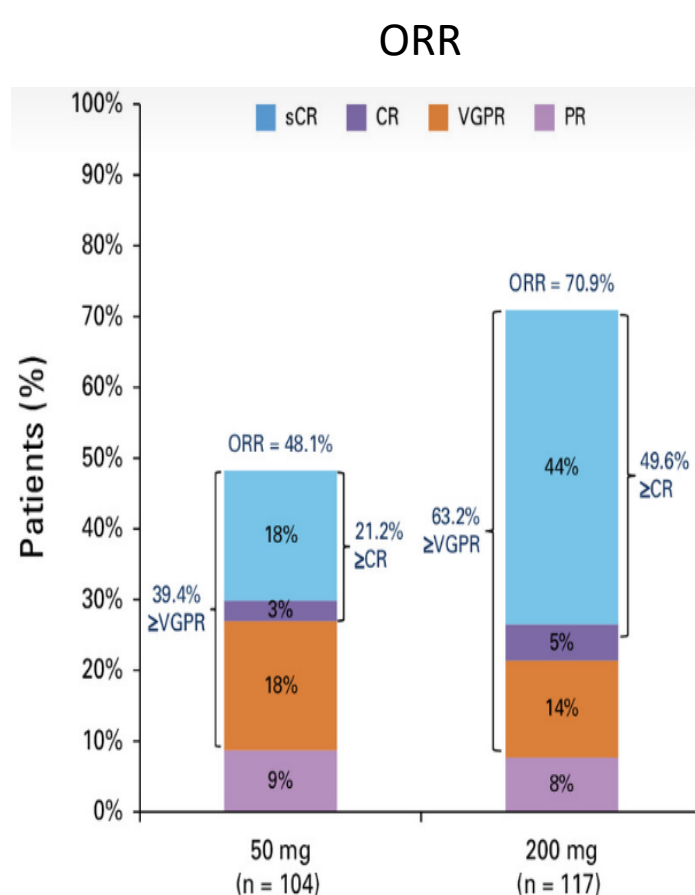
- ORR of 71%
- \geq CR of 46%
- Responses were durable and deepened over time
- 46% CRS with most Grade 1
- 8% ICANS

Conclusions

- Linvoseltamab is highly active in RRMM with promising safety profile

**NOW
RECRUITING**

LINKER-MM3 Phase 3 confirmatory clinical trial is underway NCT05137054



CR = complete response; CRS = cytokine release syndrome; DOR = duration of response; FDA = food and drug administration; ICANS = immune effector cell-associated neurotoxicity syndrome; mo = month; ORR = overall response rate; RRMM = relapsed/refractory multiple myeloma;

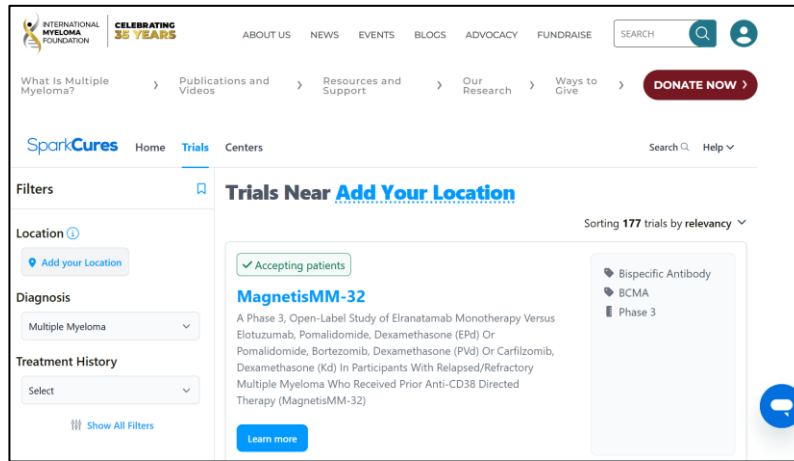
Lee HC et al. ASCO 2023. Abstr #8006. Jagannath S et al. AACR 2024. Abstr #CT001. Bumma N, et al. *J Clin Oncol*. 2024;42(22):2702-2712. Ernst D. CancerTherapy AdvisorLinvoseltamab Under Review for Relapsed/Refractory Multiple Myeloma. Accessed April 9, 2025. <https://www.cancertherapyadvisor.com/news/linvoseltamab-under-review-for-relapsed-refractory-multiple-myeloma/>



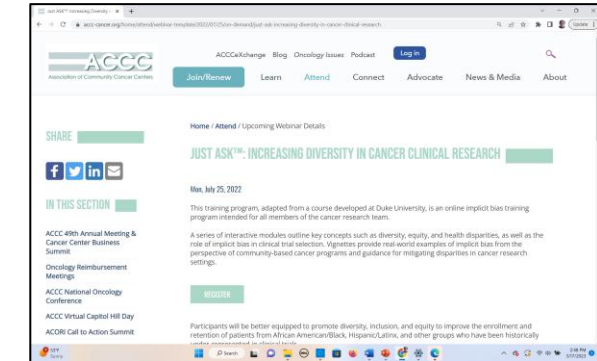
Resources to Find Clinical Trials and Avoid Bias



When is the best time to consider a clinical trial?

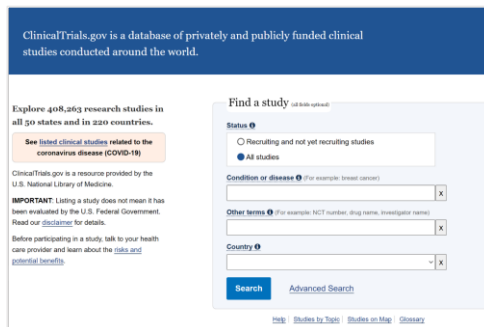


IMF clinical trial matching engine
<https://www.myeloma.org/sparkcures/trials>



Just ASK™ Implicit Bias Training from Association of Community Cancer Centers website. Accessed April 5, 2025.
<https://www.accc-cancer.org/home/attend/webinar-template/2022/07/25/on-demand/just-ask-increasing-diversity-in-cancer-clinical-research>

Clinicaltrials.gov
<https://clinicaltrials.gov/>

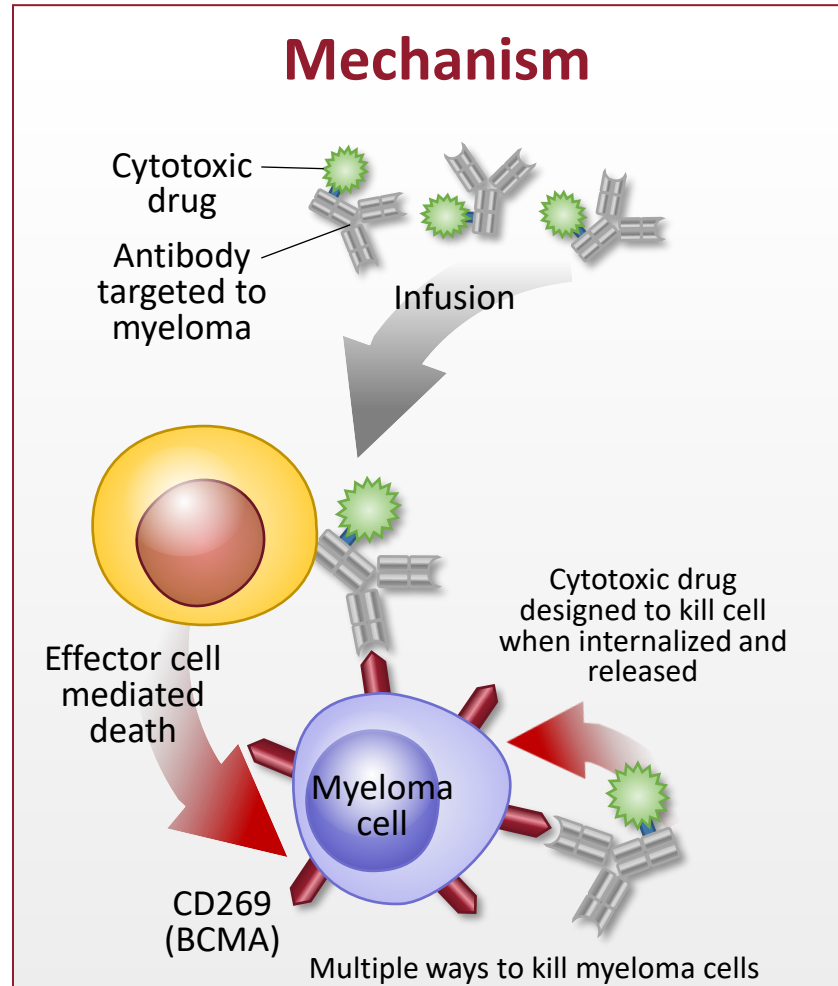


IMF InfoLine
US & Canada: 800-452-CURE (2873)
Worldwide: 1-818-487-7455
info@myeloma.org





Belantamab Mafodotin: Antibody-Drug Conjugate in Development



- Antibody with cytotoxic drug “payload”
- Can kill myeloma cells in multiple ways:
 - Antibody targets cytotoxic drug to myeloma cells
 - Antibody can recruit immune cells to kill myeloma cells



Belantamab Mafodotin Combinations (BVd, BPd) in Phase 3 Clinical Trials



WATCH FOR
FDA approval decision on BVd and BPd
expected this year

New
belantamab
regimens have
lower rates of
ocular events than
earlier ones

DREAMM-7: Phase 3, open-label, multicenter, randomized clinical trial

- Patients with 1+ prior lines of therapy: N = 494
- BVd (n = 243) vs DVd (n = 251)

Results

- Median follow-up: 28.2 months (range, 0.1-40.0)
- Median PFS
 - BVd: 36.6 months (95% CI, 28.4-NR)
 - DVd: 13.4 months 86% (95% CI, 11.1-17.5)
 - $P < 0.001$; HR: 0.41 (95% CI, 0.31-0.53)
- OS at 36 months: 74% BVd vs 60% DVd
 - Modeled median OS: 84 months BVd vs 51 months DVd
- MRD negative: 25% BVd vs 10% DVd; $P < 0.00001$
- Ocular events: 79% BVd vs 29% DVd
 - Managed with dose modifications; events of worsening visual acuity mostly resolved

More than
double the
MRD negative
rate with BVd
vs DVd

DREAMM-8: Phase 3, open-label, multicenter, randomized clinical trial

- Patients with 1+ prior lines of therapy, including a lenalidomide-containing regimen (N = 302)
- BPd (n = 155) vs VPd (n = 147)

Results

- Median follow-up: 21.78 months (range, 0.3-39.23)
- Median PFS
 - BPd: NR months (95% CI, 20.6-NR)
 - VPd: 12.7 months (95% CI, 9.1-18.5)
 - $P = 0.001$; HR = 0.52 (95% CI, 0.37-0.73)
- ORR: 77% BPd vs 72% VPd
- CR or better: 40% BPd vs 16% VPd
- OS trend favored BPd
- AEs were generally manageable; consistent with known safety profiles

AE = adverse event; BPd = belantamab mafodotin, pomalidomide, dexamethasone; BVd = belantamab mafodotin, bortezomib, dexamethasone; CR = complete response; DVd = daratumumab, bortezomib, dexamethasone; HR = hazard ratio; MRD = minimal residual disease; NR = not reached; ORR = overall response rate; OS = overall survival; PFS = progression-free survival; VPd = bortezomib, pomalidomide, dexamethasone.

Hungria V, et al. ASH Abstr #772. Hungria V, et al. ASH Abstr #3359. Hungria V, et al. *N Engl J Med*. 2024;391:393-407. Trudel S, et al. ASCO 2024. Abstr #LBA105. Belantamab mafodotin combinations accepted for review by the US FDA for the treatment of relapsed/refractory multiple myeloma. Press release. GSK. November 25, 2024. Accessed April 5, 2025. [Belantamab mafodotin combinations accepted for review by the US FDA for the treatment of relapsed/refractory multiple myeloma | GSK US](#).



Lisaftoclax: A Novel BCL-2 Inhibitor in Development for MM

Study design for patients with MM (N = 42)

- Arm A: lisaftoclax + Pd
- Arm B: lisaftoclax + DRd
- 3 median prior lines of therapy (range, 1-19)

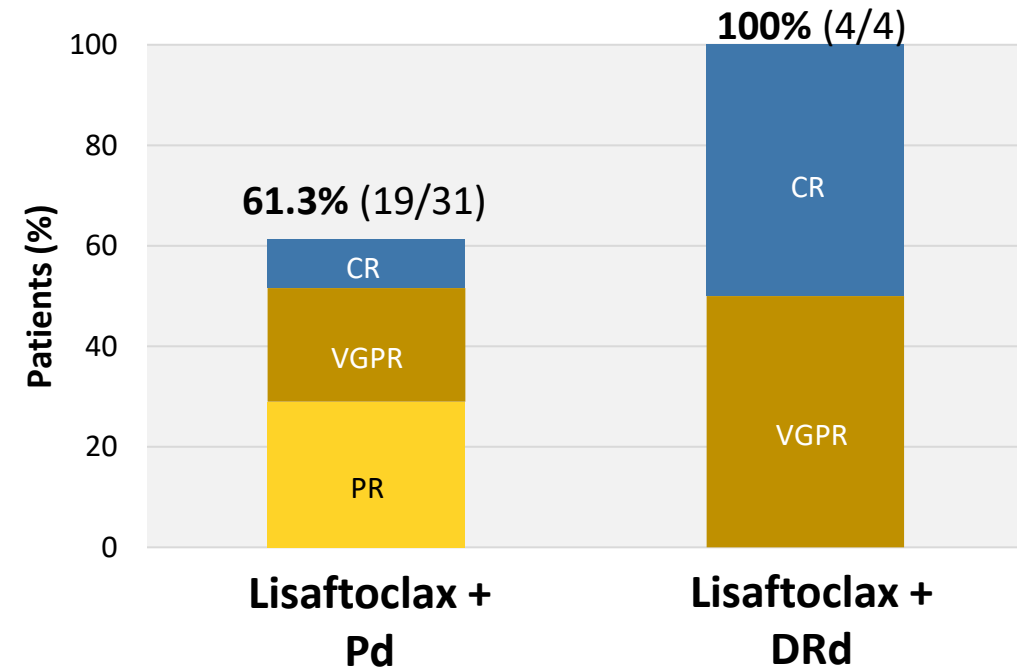
Results

- Treatment-related AEs $\geq 5\%$: neutropenia 20.4%, thrombocytopenia 6.1%, leukopenia 10.2%, nausea 16.3%, abdominal distension 10.2%, diarrhea 12.2%, and constipation 8.2%
- Pharmacokinetic analyses showed no DDIs

Conclusion

- Lisaftoclax may improve depth of response in combination with Pd or DRd in patients with MM
- Lisaftoclax has a favorable safety profile with no DDIs, particularly in hematologic side effects

ORR of Lisaftoclax Combinations in Patients With MM





CELMoDs: Oral Immune Modulatory Drugs in Development for MM

Iberdomide (Iber): activity in multiple phase 2 studies

- In patients with intermediate- or high-risk SMM
 - ORR: 79% (85% in patients completing 4+ cycles)
- COMMANDER: Iber-DKd in patients with NDMM after ASCT to eliminate MRD phase 1b/2
 - Conclusion: Iber-DKd was safe, rapidly reduced disease burden, and led to MRD negativity after modern induction and ASCT
- ICON: Iber-Cd in patients with RRMM (2-4 prior lines)
 - All-oral regimen
 - ORR: 82%; mDOR: 18.8 months
 - mPFS: 17.8 months
 - Well tolerated: common grade ≥ 3 AEs: neutropenia (57%), infections (34%)

Mezigdomide (MEZI): CC-92480-MM-002 phase 1/2

- MEZI + Vd or Kd in RRMM (≥ 1 prior line)
- ORR: $\geq 75\%$ (responses deepened over time)
- mPFS was longer in patients with fewer previous lines of therapy
- Most common grade 3/4 TEAE was neutropenia
 - Manageable with GCSF and dose modifications
- Nonhematologic grade 3/4 TEAEs were uncommon



WATCH FOR

Clinical trials with CELMoDs
iberdomide and mezigdomide

CELMoDs induce degradation of the transcription factors Ikaros and Aiolos, promoting immune-modulatory activity in MM cells. They may mitigate T-cell exhaustion, improving efficacy of T-cell-engaging therapy.

AE = adverse event; ASCT = autologous stem cell transplant; Cd = cyclophosphamide, dexamethasone; CELMoD = cereblon E3 ligase modulator; DKd = daratumumab, carfilzomib, dexamethasone; GCSF = granulocyte colony-stimulating factor; Iber = iberdomide; IMiD = immunomodulatory drug; Kd = carfilzomib, dexamethasone; mAb = monoclonal antibody; MEZI = mezigdomide; mDOR = median duration of response; MM = multiple myeloma; mPFS = median progression-free survival; MRD = minimal residual disease; NDMM = newly diagnosed multiple myeloma; ORR = overall response rate; RRMM = relapsed/refractory multiple myeloma; SMM = smoldering multiple myeloma; TEAE = treatment-emergent adverse event; Vd = bortezomib, dexamethasone; VGPR = very good partial response. Joseph NS, et al. ASH 2024. Abstr #1983. Callander N, et al. ASH 2024. Abstr #3365. Korst CLBM, et al. ASH 2024. Abstr #3371. Sandhu I, et al. ASH 2024. Abstr #1025. Meermeier EW, et al. ASH 2024. Abstr #354.



Therapies in Development for Treatment of Multiple Myeloma

CELMoD agents

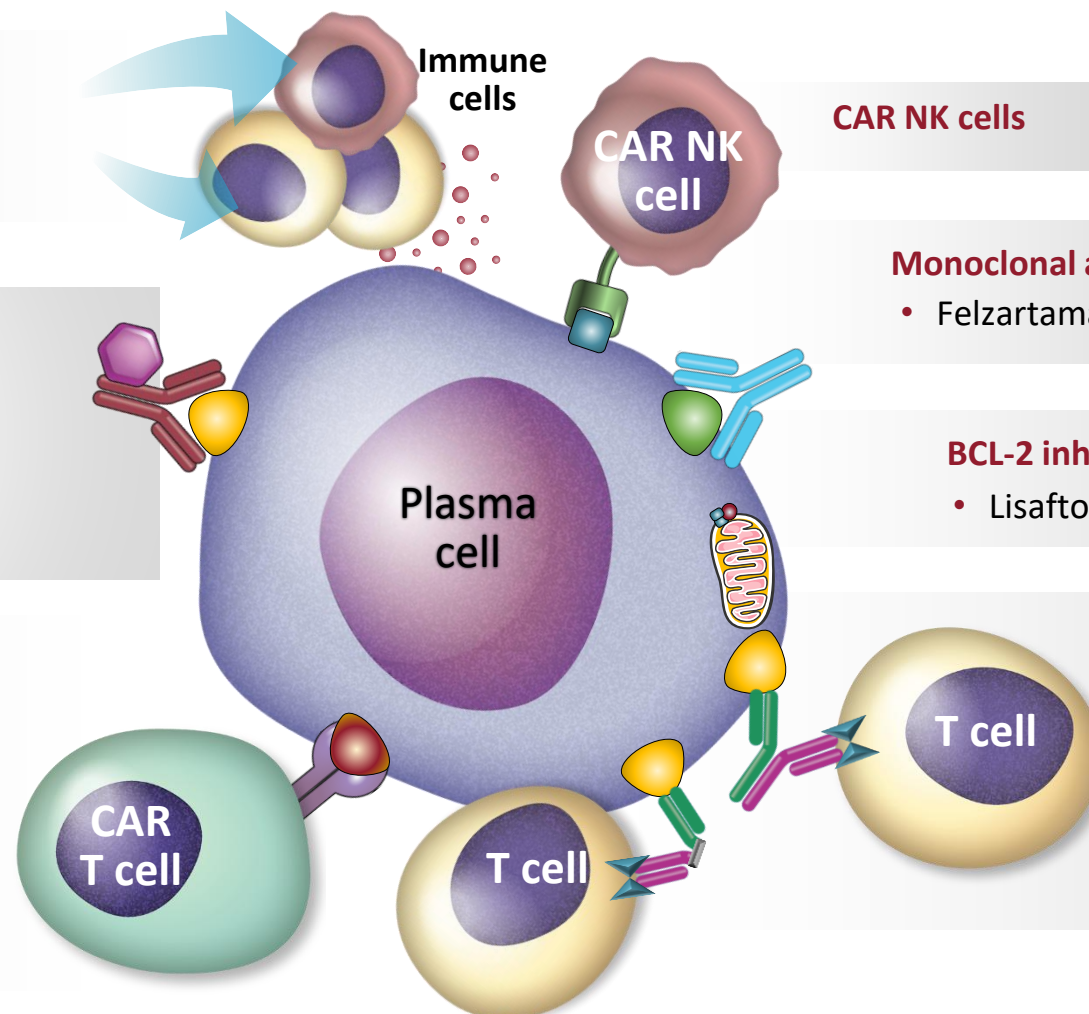
- Iberdomide (cereblon E3 ligase)
- Mezigdomide (cereblon E3 ligase)

Antibody-drug conjugates

- Belantamab mafodotin (BCMA)
- STRO-001 (CD74)
- STI-6129 (CD38)
- CC-99712 (BCMA)

CAR T-cell therapies

- BMS-986393 (GPRC5D)
- CB-011 (BCMA)
- CART-ddBCMA (BCMA)
- P-BCMA-101 (BCMA)
- PHE885 (BCMA)
- GC012F (BCMA and CD19)



CAR NK cells

Monoclonal antibodies

- Felzartamab (CD38)

BCL-2 inhibitor

- Lisoftoclax

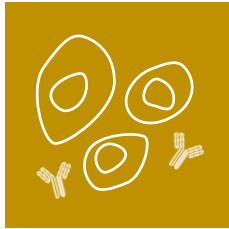
Bispecific antibodies

- Etentamig (BCMA)
- Alnuctamab (BCMA)
- Linvoseltamab (BCMA)
- Cevostamab (FcRH5)
- Forimtamig (GPRC5D)

BCL-2 = B-cell lymphoma 2; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CELMoD = cereblon E3 ligase modulator; FcRH5 = Fc receptor-homolog 5; GPRC5D = G-protein coupled receptor family C group 5 member D; HPC = hematopoietic progenitor cell; MM = multiple myeloma; NK = natural killer.

O'Neill C, van de Donk NWCJ. *EJHaem*. 2023;4(3):811-822. Hartley-Brown M, Richardson P. *Explor Target Antitumor Ther*. 2022;3(1):1-10. Ray U, Orlowski RW. *Pharmaceuticals (Basel)*. 2023;16(4):590. Vu SH, et al. *Front Oncol*. 2023;13:1275076. Frigault MJ, et al. *Blood Adv*. 2023;7(5):768-777. van de Donk NWCJ, et al. ASH 2023. Abstr #208. Richardson PG, et al. ASH 2023. Abstr #1013. Chiu H, et al. ASH 2023. Abstr #335. Bal S, et al. ASH 2023. Abstr #219.

Summary



Bispecific antibodies act as a bridge between T cells and myeloma cells to use a patient's immune system to target myeloma. **Teclistamab**, **elranatamab**, and **talquetamab** are currently FDA approved; more are in development.



Optimal sequencing of MM therapies is evolving. The IMF immunotherapy registry attempts to answer questions of sequencing using real-world data.



CRS, neurotoxicity, and hematologic toxicities are important AEs for all **bispecific antibodies**.



Many new drugs are in development, with different targets, including CELMoD agents, BCL-2 inhibitors; monoclonal antibodies, bispecific monoclonal antibodies (T-cell engagers), and antibody-drug conjugates.



BCMA-directed bispecific antibodies carry heightened **infection risk**.
GPC5D-directed bispecific antibodies carry the **possibility of skin, nail, and oral AEs**.



Clinical trial participation by diverse populations is essential to ensure that new drugs are appropriate for diverse populations.

AE = adverse event; BCL-2 = B-cell lymphoma 2; BCMA = B-cell maturation antigen; CAR = chimeric antigen receptor; CRS = cytokine release syndrome; CELMoD = cereblon E3 ligase modulator; FDA = US Food and Drug Administration; GPCR5D = G-protein coupled receptor family C group 5 member D; IMF = International Myeloma Foundation; MM = multiple myeloma.

O'Neill C, van de Donk NWCJ. *ElHaem*. 2023;4(3):811-822. Cho S-F, et al. *Front Oncol*. 2022;12:1032775. TECVAYLI® (teclistamab-cqyv) Prescribing Information. ELREXFIO® (elranatamab-bcmm) Prescribing Information. TALVEY® (talquetamab-tgvs) Prescribing Information. Catamero D, et al. Presented at: 20th International Myeloma Society (IMS) Annual Meeting Nurse Symposium; September 27-30, 2023; Athens, Greece. Patel U, et al. ASCO 2023. Abstr #e20049. Mouhieddine TH, et al. *Blood Adv*. 2023;7(6):1056-1064. Del Giudice ML, et al. *Cancer Immunol Immunother*. 2023;72(12):3931-3937. The IMF's Immune Therapy Registry. Accessed April 5, 2025. <https://www.myeloma.org/international-myeloma-working-group/imfs-immune-therapy-registry>. Catamero D, et al. *J Adv Pract Oncol*. 2022;13(suppl 4):31-43. Hartley-Brown M, Richardson P. *Explor Target Antitumor Ther*. 2022;3(1):1-10. Ray U, Orlowski RW. *Pharmaceuticals (Basel)*. 2023;16(4):590. Vu SH, et al. *Front Oncol*. 2023;13:1275076. Frigault MJ, et al. *Blood Adv*. 2023;7(5):768-777. van de Donk NWCJ, et al. ASH 2023. Abstr #208. Richardson PG, et al. ASH 2023. Abstr #1013. Chiu H, et al. ASH 2023. Abstr #335. Ailawadhi S, et al. ASH 2024. Abstr #654. Regnante JM, et al. *J Oncol Pract*. 2019;15(4):e289-e299.

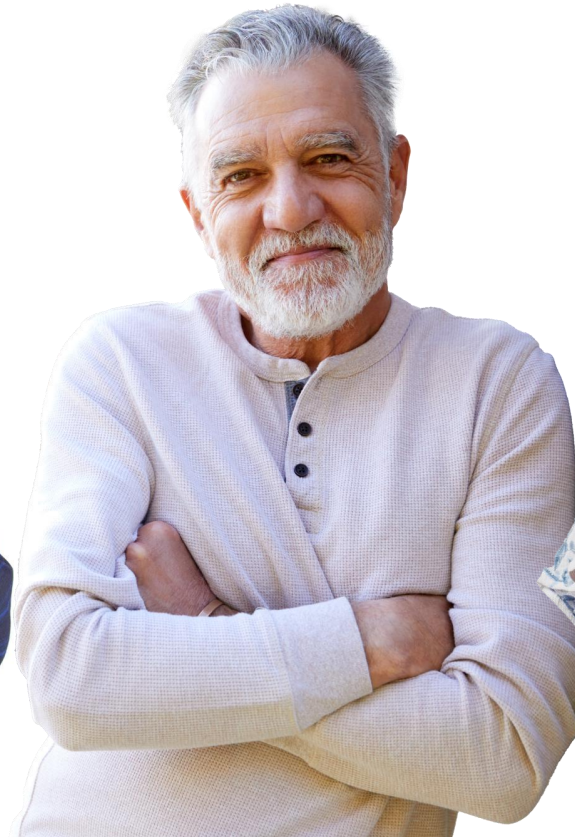
Thank You for Sharing in the Stories of Our Patients



Anne*



Marcus*



Julio*



Linda*

We Hope You Had an Enjoyable and Educational Time

At the conclusion of the educational presentation, the participant will be able to:

1

Discuss AE management, patient/care partner education, therapy sequencing, and bridging therapy for the latest treatments for patients with multiple myeloma, including upfront quadruplet regimens, T-cell engagers (bispecific antibodies), CAR-T cell therapy, CD38 antibodies, XPO inhibitors, CELMoDs, and antibody-drug conjugates

2

Use tactics to enhance access to therapies and clinical trials, including best practices for transitions of care

3

Explain the importance of minimal residual disease (MRD) and identify treatment strategies to attain it

4

Identify disparities faced by patients with multiple myeloma and strategies to overcome these, including increasing participation in clinical trials (eg, health equity)



Remember the Resources to Enhance Your Ability to Care for Your Patients With MM

<https://imf-ons.myeloma.org/>
password: ons2025



Hi, I'm Myelo.
How can I help you
today?

...and Much, Much, More!

MM = multiple myeloma.

Thank You for Your Attendance and Participation

*On behalf of the IMF, with the generous support from AbbVie, Inc.; Arcellx, Inc.; Janssen Biotech, Inc., administered by Janssen Scientific Affairs, LLC; Karyopharm Therapeutics; Kite Pharma, Inc.; Legend Biotech; Pfizer Inc.; Regeneron Pharmaceuticals, Inc.; and Sanofi, **we thank you.***

Please Contact IMF for Further Information and Resources:

1-800-452-CURE TheIMF@myeloma.org
(1-800-452-2873) <http://myeloma.org>



Don't forget
to turn in
your
YELLOW
eval for CNE
credit

Slides and Resources available at:
<http://imf-ons.myeloma.org>
Password: ons2024