UCCH Pathway

UCCH Guideline Multiple Myeloma

2.03.01 Anlage 28

Version May 2021

Hubertus Wald Tumorzentrum
Universitäres Cancer Center Hamburg
Ein Kompetenznetzwerk des UKE

Guideline Multiple Myeloma

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Multiple Myeloma board members

K. Weisel, J. Dierlamm, A. Asemissen, L. Leypoldt (Med. Oncology)
C. Wolschke, N. Kröger, F. A. Ayuk (Stem Cell Transplantation)
S. Klutmann, I. Apostolova (Nuclear Medicine)
B. Koch, M. Eggers, A. Hell (UCCH)
C. Schlüter, Stefan Bartels (KKR)
T. Frenzel, A. Krüll, S. Brackrock, G. Matnjani, Y Goy (Radiooncology)
W. Wilczak, W. Fehrle (Pathology)
U. Göbel (patient representative UCCH)
M. Dreimann (Spine Surgery)
M. Nickelsen, V. Böhme (Onkologie Lerchenfeld)
M. Priemel (Traumatology)
J. Schulze zur Wiesch (Internal Medicine)

Responsible author	K. Weisel (Med. Oncology)
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Legend of Colours

= Therapeutic procedure

= Clinical or diagnostical condition

= Diagnostic procedure

= Clinical trial

= Supportive measure

= Referral

= Tumorboard (including post tumorboard interaction with patient that follows the principles of shared decision-making)

Version April/2021

Pathway: Multiple Myeloma

2.03.01 Anlage 28

Initial Assessment

- Medical history and physical exam
- Lab exam (blood):
  - Complete blood count, Creatinine, eGFR, calcium, LDH, ß-2-microglobuline, albumine, proBNP, total protein, GPT, CRP
  - Protein electrophoresis with quantified M-protein
  - Immunoglobulines: IgG, IgA, IgM (IgD in case of IgD myeloma)
  - Immunofixation
  - Free light chains kappa and lambda, free light chain ratio
- 24 h urine:
  - Urine M-protein (Excretion of lg light chains kappa and lambda)
  - Immunofixation, total protein in 24 h sample, albumine in 24 h sample
- Bone marrow:
  - Aspiration and biopsy with morphology, flow cytometry and cytogenetics (FISH: t(4;14), del17p13, 1q21 gain/del1p32 with copy number, t(14;16), t(11;14))
- Skeleton imaging:
  - Low-dose whole-body CT scan (Osteo-CT)
  - Whole-body MRI in suspected asymptomatic MM (to detect focal lesions), apparently solitary plasmocytoma or suspected cord compression
  - PET-CT in case of extramedullary disease
- Consider biopsy in case of extramedullary manifestation

Leaflets/ direct contact information:

- Offer contact to self help group (hand out leaflet)
- Offer psychooncological support
- If desired, offer complementary medicine support

TB

≥ 10% clonal PC in BM and/or ≥ 30 g/l M-protein (Serum) and/or ≥ 500 mg M-protein (Urine)

no MDE[1] -

→ Asymptomatic MM

→ staging by R-ISS[2]

→ Watch and wait Follow up (page 6)

→ Clinical trial

Singular manifestation in CT/PET-CT/MR

< 10% clonal PC in BM

Biopsy proven clonal PCI

no MDE[1] -

→ Solitary MM

→ staging by R-ISS[2]

→ Local RTx

≥ 10% clonal PC in BM

M-protein in serum and/or urine

MDE[1] +

→ Multiple Myeloma

→ risk assesment by R-ISS[2]

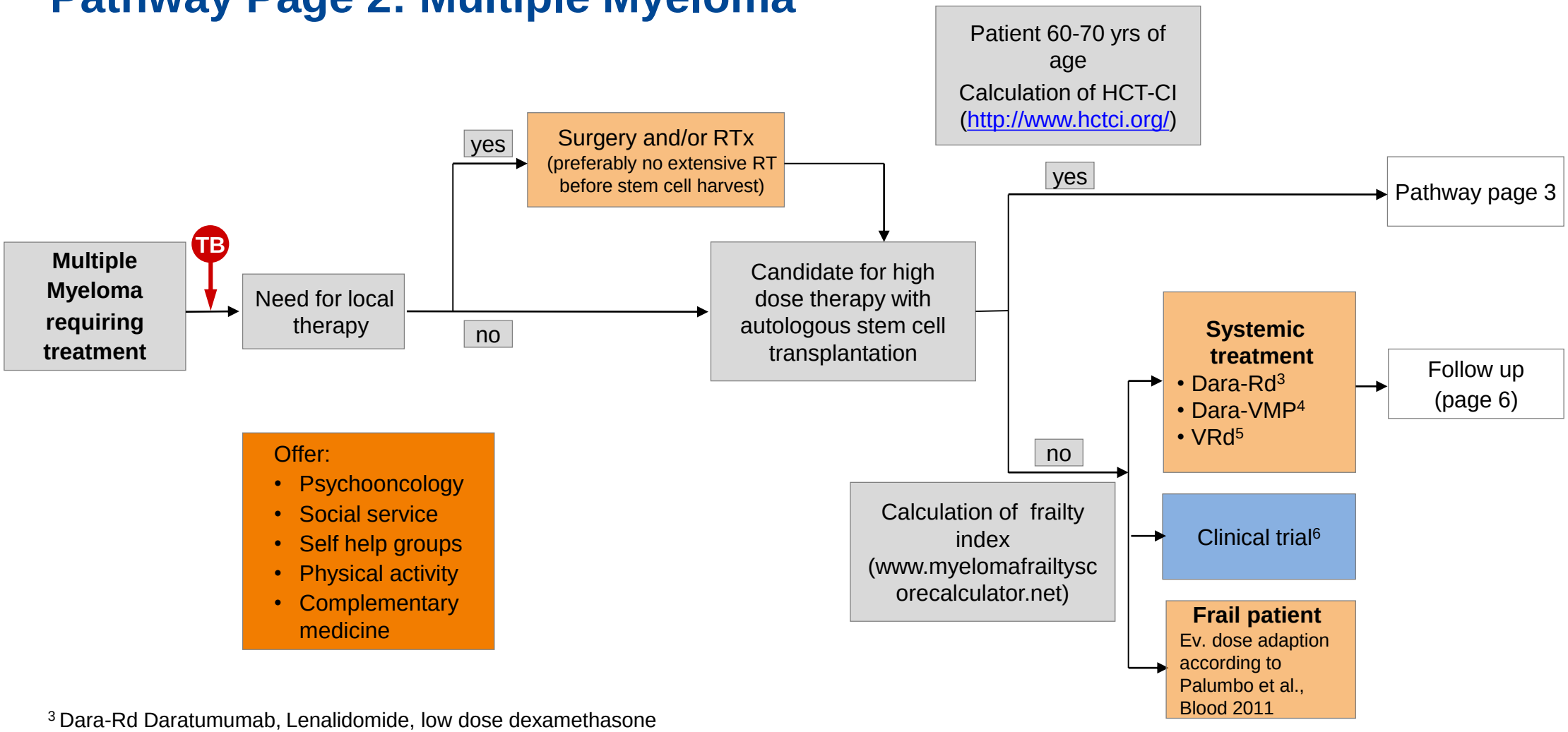
→ Pathway page 2

[1] **M**yeloma **D**efining **E**vents (Rajkumar et al., Lancet Oncol 2014):
1. CRAB = **C**alcium elevation, **R**enal insufficiency (Creatinine > 2 mg/dl; GFR [MDRD] < 40 ml/min), **A**nemia (Hb < 10 g/dl or 2 g/dl < normal), ≥ 1 lytic **B**one lesions or presence of recurrent bacterial infections/Hyperviscositiy/AL-Amyloidosis **2. Biomarkers of malignancy** = clonal bone marrow plasma cells ≥ 60%, involved:uninvolved free light chain ratio ≥ 100 (according to the Binding Site test), > 1 focal lesion on MRI > 5mm (Rajkumar/IMWG, Lancet Oncol 2014)

RTx Radiotherapy

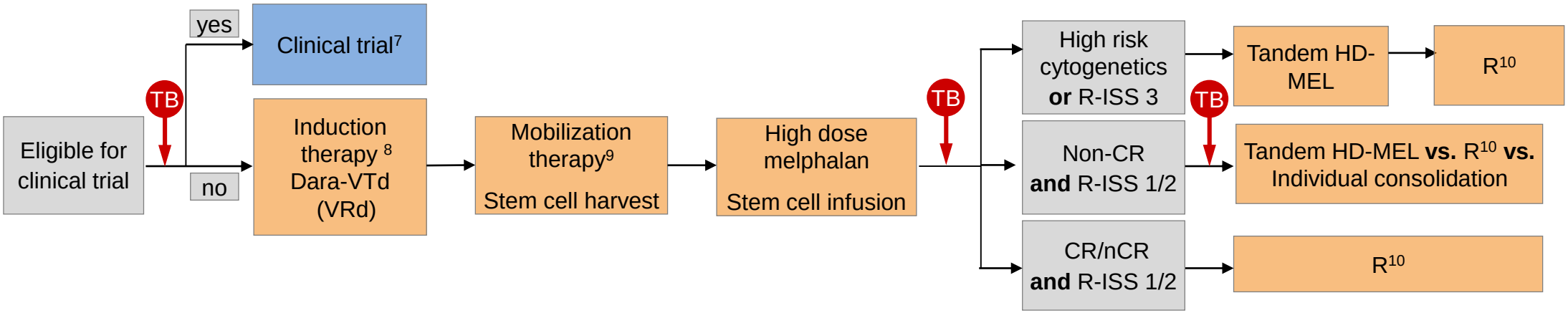
[2] **R**evised **I**nternational **S**taging **S**ystem: Stage I, Serum beta-2 microglobulin < 3.5 mg/L **and** serum albumin ≥ 3.5 g/dL **and** cytogenetic standard risk **and** LDH ≤ UNL; Stage II, neither Stage I nor III; Stage III, Serum beta-2 microglobulin ≥ 5.5 mg/L and cytogenetic high-risk (del17p13 or t(4;14) or t(14;16)) or LDH > UNL (Palumbo et al., JCO 2015)

Pathway Page 2: Multiple Myeloma



[3] Dara-Rd Daratumumab, Lenalidomide, low dose dexamethasone
[4] Dara-VMP Daratumumab, Bortezomib, Melphalan, Prednisone
[5] VRd Bortezomib, Revlimid, Dexamethasone
[6] DREAMM-9 trial; in case of cytogenetic high risk (del17p > 10%, t(4;14), t(14;16), all with ISS2/3): CARTITUDE-2 trial
RTx Radiotherapy

Pathway Page 3: First-line treatment for transplant-eligible patients



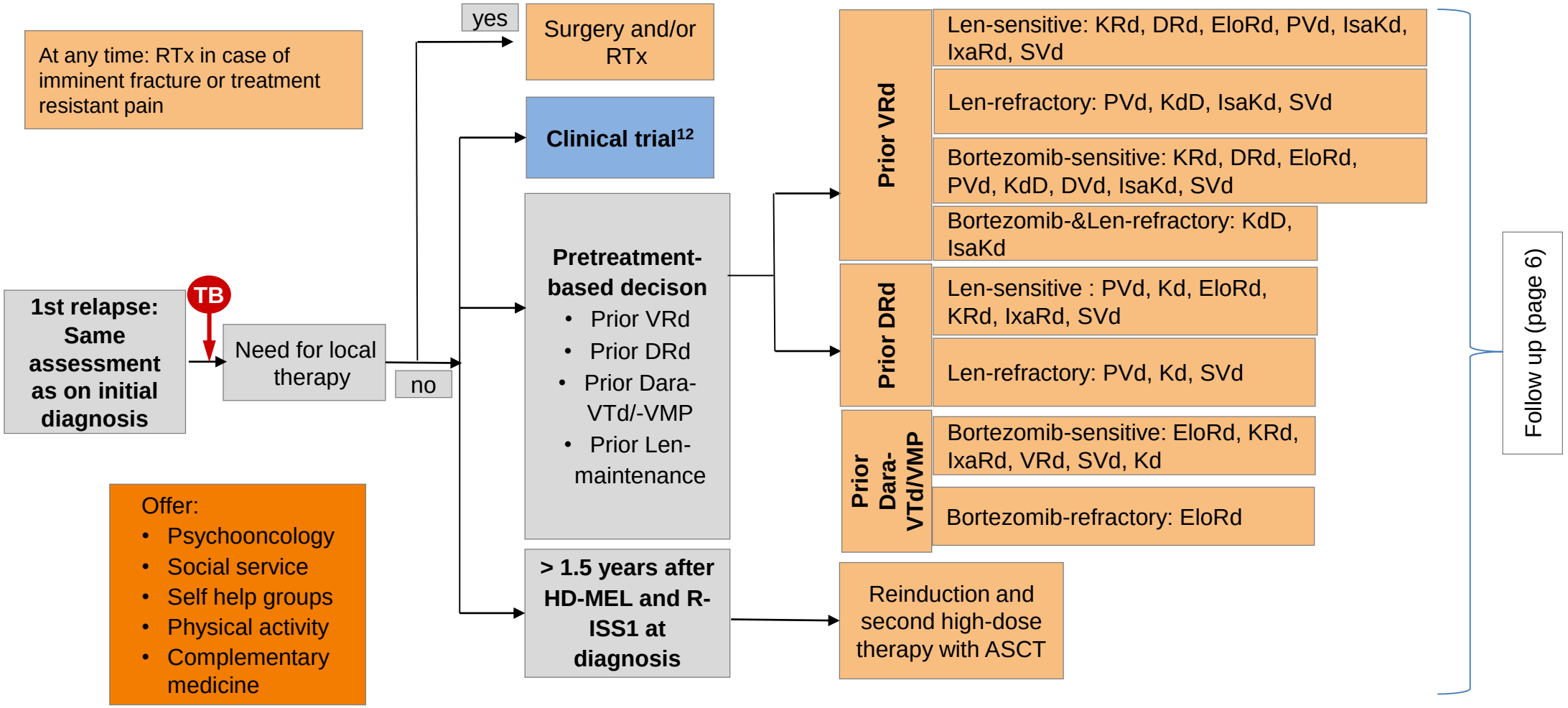
[7] **18-70 years** → Cytogenetic standard-risk: EMN24 trial, cytogenetic high risk (del17p > 10%, t(4;14), t(14;16), ≥ 3 copies1q21 all with ISS2/3): GMMG-CONCEPT trial or high risk (del17p) aged <60 years allogeneic SCT (AlloMMPostCy trial)

[8] **Induction therapy (4 cycles): Daratumumab, Bortezomib, Thalidomide, Dexamethasone (Dara-VTd) (preferred) or** Bortezomib, Lenalidomid, Dexamethason (VRd)

[9] **Mobilization therapy:** CAD + G-CSF, Cyclophosphamide + G-CSF or G-CSF steady state

[10] **Maintenance treatment:** Revlimid (10 mg → 15 mg after 3 months, if tolerated) until PD

Pathway Page 4: Relapsed/ refractory multiple myeloma[11] (1st relapse)

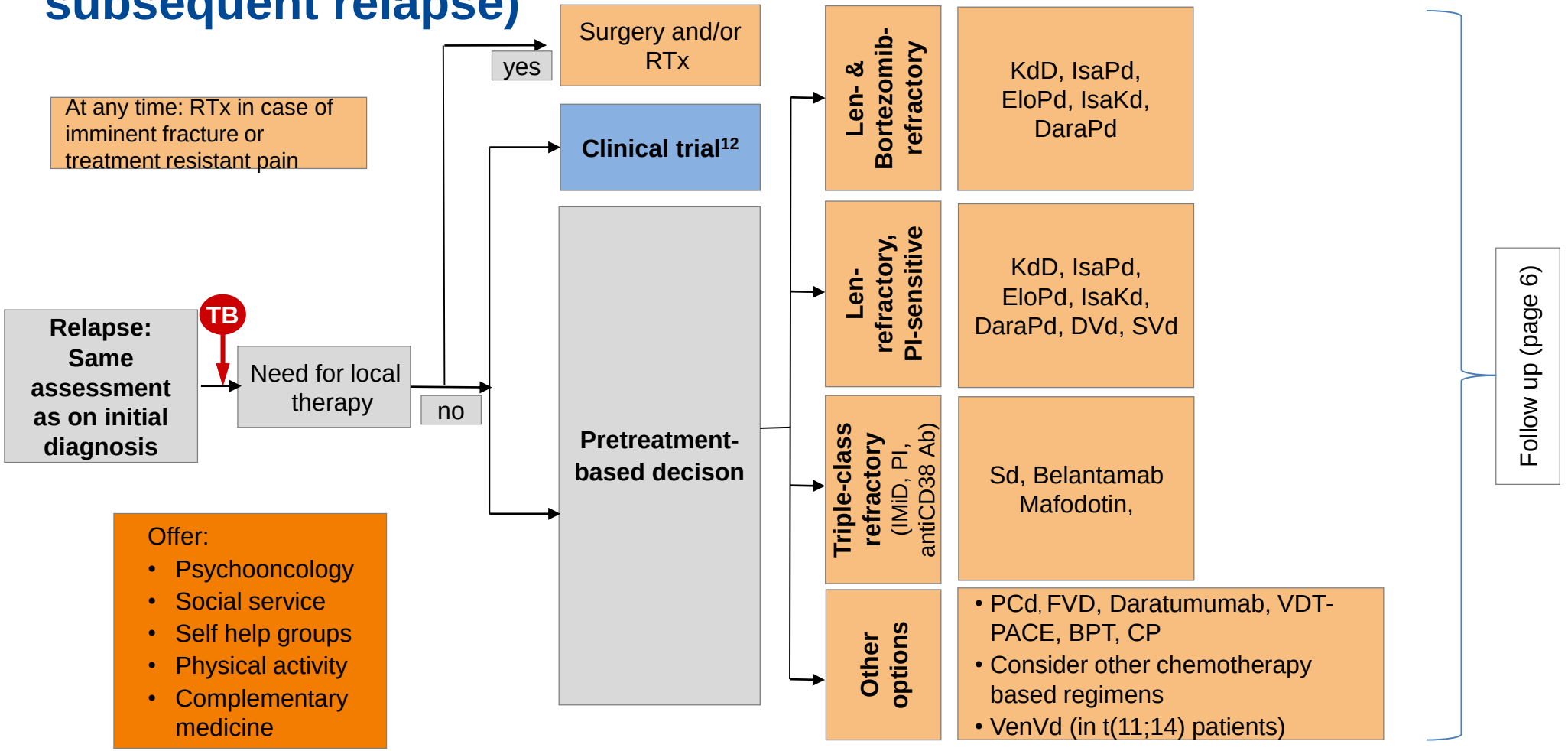


[11]According to IMWG uniform response criteria (Durie et al., Leukemia 2006) [12] According to I/E criteria and pretreatment, see TrialFinder

Therapy regimens: DRd Daratumumab/Lenalidomide/dexamethasone, DVd Daratumumab/Velcade/dexamethasone, EloRd Elotuzumab/Lenalidomide/dexamethasone, IsaKd Isatuximab/Carfilzomib/dexamethasone (after approval), IxaRd Ixazomib/Lenalidomid/dexamethasone, Kd Carfilzomib/dexamethasone, KdD Daratumumab/Carfilzomib/dexamethasone, KRd Carfilzomib/Lenalidomide, dexamethasone, PVd Pomalidomide/Bortezomib/dexamethasone, SVd Selinexor/Bortezomib/dexamethasone (after approval)

RTx Radiotherapy

Pathway Page 5: Relapsed/ refractory multiple myeloma[11] (2nd and subsequent relapse)



[11] According to IMWG uniform response criteria (Durie et al., Leukemia 2006) [12] According to I/E criteria and pretreatment

Therapy regimens: BPT Bendamustine/prednisone/Thalidomide, CP Cyclophosphamide/prednisone, DPd Daratumumab/Pomalidomide/dexamethasone (after approval), DVd Daratumumab/Velcade/dexamethasone, EloPd Elotuzumab/Pomalidomide/dexamethasone, EloRd Elotuzumab/Lenalidomide/dexamethasone, FVD Panobinostat/Bortezomib/Dexamethasone, IsaKd Isatuximab/Carfilzomib/dexamethasone (after approval), IsaPd Isatuximab/Pomalidomide/dexamethasone, KdD Daratumumab/Carfilzomib/dexamethasone, KRd Carfilzomib/Lenalidomide, dexamethasone, PCd Pomalidomide/Cyclophosphamide/dexamethasone, Sd Selinexor/dexamethasone (after approval), SVd Selinexor/Bortezomib/dexamethasone (after approval), VDT-PACE Velcade/Dexamethasone/Thalidomide/ Cisplatin/Adriamycine/Cyclophosphamide/Etoposide, VenVd Venetoclax/Bortezomib/dexamethasone (in t(11;14) patients only, after individual approval by health insurance RTx Radiotherapy

Page 6: Follow up

Follow up in asymptomatic multiple myeloma

- Clinical presentation and lab exam 3 months after initial diagnosis, afterwards every 4-6 months for one year, then every 6-12 months
- 24 h urine and NT-proBNP testing at least once per year (screening for AL Amyloidosis)
- Whole-body MRI and/or low-dose whole-body CT scan (Osteo-CT) if there is evidence for progression
- Offer contact to psychooncology and/or self help group whenever necessary

Follow up in multiple myeloma after achieving a stable remission

- Clinical presentation and lab exam + 24-h urine (see at ”initial assessment“) every three months or if clinically indicated
- Low-dose whole-body CT scan (Osteo-CT) once a year or if there is evidence for progression
- Offer contact to psychooncology and/or self help group whenever necessary

Page 7: Treatment schemes and dose modifications I

Newly diagnosed MM – transplant-eligible Patients

Induction therapy: VRd (four 21 days cycles)	**Dose modification**
Bortezomib 1,3 mg/m^2 s.c. d1,4,8,11	See recommendations for peripheral neuropathy
Lenalidomide 25 mg p.o. d1-14	Dose adaption according to GFR (see SmPC)
Dexamethasone 20 mg p.o. d1,2, 4,5, 8,9, 11,12, 15	
Special prophylaxis: Aciclovir 400 mg p.o. twice daily; tromboembolic prophylaxis with LMWH or according to risk, antibiotic prophylaxis for 2-4 cycles recommended	

Dara-VTd (four 28 days cycles + Dara consolidation two 28 day cycles)	**Dose modification**
Daratumumab 16 mg/kg i.v. (cycle 1+2: d 1,8,15,22 cycle 3+4: d 1, 15, cycle 5-6 after HDCT and ASCT: d1,15)	
Thalidomid 100 mg p.o. daily (all cycles)	See recommendations for peripheral neuropathy
Dexamethason 40 mg p.o. (cycle 1+2 d1,2,8,9,15,16,22,23, cycle 3+4 d1,2) Dexamethason 20mg p.o. (cycle 3+4 d8,9,15,16, cycle 5+6 d1,2,8,9,15,16)	
Bortezomib 1,3 mg/m^2 s.c. (all cycles: d 1,4,8,11)	See recommendations for peripheral neuropathy
Special prophylaxis: Aciclovir 400 mg p.o. twice daily, see recommendations for pre-infusion medications by SmPC, tromboembolic prophylaxis with LMWH or according to risk, antibiotic prophylaxis for 2-4 cycles recommended	

Stem cell mobilization: G-CSF alone	**Dose modification**
Lenograstim 300 µg/m²/d (devided on two doses)/Filgrastim 10 µg/kg/d 2 x twice daily s.c. d1 until end of apheresis (Apheresis should be started on day 4 or 5) Target for CD34 cell collection: 3 compounds, ≥ 2.5 x 10^6 CD34+ cells/kgBW per compound	

Page 8: Treatment schemes and dose modifications II

Newly diagnosed MM – transplant-eligible Patients

Stem cell mobilization: Cyclophosphamide + G-CSF	**Dose modification**
Cyclophosphamide 2500 mg/m² i.v. d1	Age > 65 years: 2000 mg/m² i.v. d1 GFR < 10 ml/min: 1250 mg/m² i.v. d1, 2
Lenograstim 263 µg/Filgrastim 48 Mio. IE s.c. daily d5 until end of apheresis (Apheresis should be started after the nadir when 5-10/nl Leukocytes are present in peripheral blood, usually around day 11-13) Target for CD34 cell collection: 3 compounds, ≥ 2.5 x 10^6 CD34+ cells/kgBW per compound	

Stem cell mobilization: CAD + G-CSF	**Dose modification**
Cyclophosphamide 1000 mg/m² i.v. d1	GFR 45-10 ml/min 75%, < 10 ml/min: 50%
Adriamycin 15 mg/m² i.v. d1-4	
Dexamethasone 40 mg p.o. d1-4	
Lenograstim 300 µg/m²; Filgrastim 10 µg/kg s.c. daily in 2 split doses d9 until end of apheresis (Apheresis should be started after the nadir when 5-10/nl Leukocytes are present in peripheral blood, usually around day 13) Target for CD34 cell collection: 3 compounds, ≥ 2.5 x 10^6 CD34+ cells/kgBW per compound	

Highdose melphalan with ASCT	**Dose modification**
Melphalan 100 mg/m² i.v. d-3, -2	GFR < 40 ml/min 100 mg/m² d-3 (50% dose reduction)
Autologous stem cell reinfusion d0	
Lenograstim 263 µg/Filgrastim 48 Mio. IE s.c. daily d1 until neutrophil recovery	
Special prophylaxis: Aciclovir 400 mg p.o. two times daily; Cotrim 960 mg p.o. twice-weekly (Sa + Su) for three months	

Lenalidomide maintenance	**Dose modification**
Lenalidomide 10 mg p.o. daily starting on d60-90 after ASCT (→ 15 mg after 3 months)	According to GFR (see SmPC)
Thromboembolic prophylaxis according to risk, not obligate	

Page 9: Treatment schemes and dose modifications III

Newly diagnosed MM - transplant-ineligible patients

Dara-VMP (nine 42 days cycles + Dara Maintenance 28 day cycles)	**Dose modification**
Daratumumab 16 mg/kg i.v. (cycle 1: d 1,8,15,22,29,36 cycle 2-9: d 1, 22, cycle 10+ d1 every 4 weeks)	
Melphalan 9 mg/m^2 p.o. d1-4 (cycle 1-9)	See recommendations for peripheral neuropathy
Prednisone 60 mg/m^2 p.o. d1-4 (cycle 1-9)	
Bortezomib 1,3 mg/m^2 s.c. (cycle 1: d 1,4,8,11,22,25,29,33 cycle 2-9: d 1,8,22,29)	
Special prophylaxis: Aciclovir 400 mg p.o. twice daily, see recommendations for pre-infusion medications by SmPC	

DRd until progression (28 days cycles)	**Dose modification**
Lenalidomide 25 mg p.o. daily d1-21	According to GFR (see SmPC)
Dexamethasone 40 mg p.o. d1, 8, 15, 22 (pt. > 75 y. 20 mg)	
Daratumumab 16 mg/kg i.v. (cycle 1+2: d 1,8,15,22, cycle 3-6 d 1,15, cycle 7+ d1)	
Special prophylaxis: Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily, see recommendations for pre-infusion medications by SmPC	

VRd (Eight 21 days cycles, followed by 28 days cycles)	**Dose modification**
Bortezomib 1,3 mg/m^2 s.c. d1, 4, 8, 11 (cycle 1-8)	See recommendations for peripheral neuropathy
Lenalidomide 25 mg p.o. (cycle 1-8: d1-14, cycle 9+: d1-21)	Dose adaption according to GFR (see SmPC)
Dexamethasone 20 mg p.o. (cycle 1-8 d1,2, 4,5, 8,9, 11,12), 40 mg (cycle 9+ d 1,8,15,22)	
Special prophylaxis: Aciclovir 400 mg p.o. twice daily; , Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily	

Page 10: Treatment schemes and dose modifications IV

Relapsed/refractory MM (only selected treatments – see each applicable SmPCs for other treatment schemes

KdD (28 days cycles until disease progression)	Dose modification
Carfilzomib 20 mg/m² (cycle 1 d 1,2) 56 mg/m² i.v. (cycle 1 d 8,9,15,16, cycle 2+ d1,2 8,9 15,16	
Daratumumab 16 mg/kg i.v. (cycle 1+2: d 1,8,15,22, cycle 3-6: d 1, 15, cycle 7+ d1 every 4 weeks)	
Dexamethasone 20 mg p.o./i.v. d1,2 8,9 15,16 and 40 mg p.o. d22	
Special prophylaxis: see recommendations for pre-infusion medications by SmPC	

Belantamab Mafodotin (21 days cycles until disease progression)	Dose modification
Belantamab Mafodotin 2,5mg/kg i.v.	See SmPC for corneal toxicities
Special prophylaxis: preservative-free eyedrops (at least 4x/d) and ophthalmologic controls; see recommendations for pre-infusion medications by SmPC	

IsaPd until progression (28 days cycles)	Dose modification
Pomalidomide 4 mg p.o. daily d1-21	See recommendations for cytopenia according to SmPC
Isatuximab 10 mg/kgKG i.v. d1, 8, 15, 22 in cycle 1 and d1, 15 in cycle 2+	
Dexamethasone 40 mg p.o. d1, 8, 15, 22	Age ≥ 75 years: Dexamethasone 20 mg
Special prophylaxis: Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily	

KRd (eighteen 28 days cycles followed by Rd or cont.)	Dose modification
Carfilzomib 27 mg/m² (first 2 infusions 20 mg/m²) i.v. d1+2, 8+9, 15+16 cycle 1-12 and d1+2, 15+16 in cycle 13-18	See recommendations for RI + cytopenia according to SmPC
Lenalidomide 25 mg p.o. d1-21	
Dexamethasone 40 mg p.o. d1, 8, 15, 22	
Special prophylaxis: Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily	

Page 11: Treatment schemes and dose modifications V

Relapsed/refractory MM

VDT-PACE (max. four cycles)	**Dose modification**
Bortezomib 1,0 mg/m² s.c. d1,4,8,11	See recommendations for peripheral neuropathy
Thalidomide 50-100 mg p.o. daily	Dose adaption according to GFR
Cisplatin 10 mg/m² 24h continuous i.v. d 1-4	
Cyclophosphamide 400 mg/m² 24h continuous i.v. d1-4	
Etoposide 40 mg/m² 24h continuous i.v. d1-4	
Doxorubicin 10 mg/m² 24h continuous i.v. d1-4	
Dexamethasone 40 mg p.o. d1-4	
Central iv line needed, Aciclovir 400 mg p.o. twice daily, thromboembolic prophylaxis according to risk and cytopenia, consider antibiotic and antifungal prophylaxis	

PCd until progression (28 days cycles)	**Dose modification**
Pomalidomide 4 mg p.o. daily d1-21	See recommendations for cytopenia according to SmPC
Cyclophosphamide 500 mg/m² p.o./i.v. d 1, 15	
Dexamethasone 40 mg p.o. d1, 8, 15, 22	
Special prophylaxis: Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily	

EPd until progression (28 days cycles)	**Dose modification**
Pomalidomide 4 mg p.o. daily d1-21	See recommendations for cytopenia according to SmPC
Elotuzumab 10 mg/kgKG i.v. d1, 8, 15, 22 in cycle 1+2 ; cycle 3+ 20 mg d1	
Dexamethasone 40 mg p.o. d1, 8, 15, 22	
Special prophylaxis: Aspirine 100 mg p.o. daily or, with previous history of thromboembolism, enoxaparine 40 mg s.c. daily	

Page 13: Treatment schemes and dose modifications VII

Relapsed/refractory MM

VenVd (cycle 1-8: 28 days cycles, cycle 9+: 42-day cycles)	**Dose modification**
Venetoclax 800mg p.o. cycles 1-8: d1 – 21, cycles 9+: days 1 - 35 dexamethasone 20 mg on Days 1, 2, 8, 9, 15, 16, 22 and 23	See recommendations for peripheral neuropathy
Bortezomib 1,3 mg/m^2 s.c. d1, 4, 8, 11 in cycle 1-8 and d1,8,15,22 in cycle 9+	
Dexamethasone 20 mg p.o. on days 1, 2, 4, 5, 8, 9, 11, 12 in cycle 1-8 and days 1, 2, 8, 9, 15, 16, 22, 23 from cycle 9+	
Special prophylaxis: Aciclovir 400 mg p.o. twice daily, antibiotic prophylaxis should be administered	

FVD (max. sixteen 21 days cycles)	**Dose modification**
Panobinostat 20 mg p.o. d1, 3, 5 and 8, 10, 12	See recommendations for peripheral neuropathy (page 11/12)
Bortezomib 1,3 mg/m^2 s.c. d1, 4, 8, 11 in cycle 1-8 and d1+8 in cycle 9-16	
Dexamethasone 20 mg p.o. d1, 2, 8, 9, 15, 16, 22, 23 in cycle 1-8 and d1+2, 8+9 in cycle 9-16	
Special prophylaxis: Aciclovir 400 mg p.o. twice daily, supportive care for Panobinostat according SmPC	

BPT (max. six 28 days cycle)	**Dose modification**
Bendamustine 100 mg/m^2 i.v. d1, 2	At high age or BM-Insufficiency: 50-90 mg/m^2 i.v. d1, 2
Thalidomide 100-200 mg p.o. daily	
Prednisolone 60 mg/m^2 p.o. d1-4	

CP (continous therapy until best response or progression)	**Dose modification**
Cyclophosphamide 50 mg p.o. daily	
Prednisolone 50-100 mg p.o. on alternate days	

Page 14: Treatment algorithm for elderly frail patients (Palumbo et al., Blood 2011)

Risk Factors
• Age over 75 years • Mild, moderate or severe frailty: patients needing help for houshold tasks and personal care • Comorbidities: cardiac dysfunction, pulmonary dysfunction, hepatic dysfunction, renal dysfunction

GO-GO	MODERATE-GO	SLOW-GO
No risk factors DOSE LEVEL 0	At least one risk factor DOSE LEVEL -1	At least one risk factor plus occurrence of grade 3-4 non-hematologic AE DOSE LEVEL -2

Agent	DOSE LEVEL 0	DOSE LEVEL -1	DOSE LEVEL -2
Dexamethasone	40 mg/d d 1,8,15,22 / 4 wks	20 mg/d d 1,8,15,22 / 4 wks	10 mg/d d1,8,15,22 / 4 wks
Melphalan	0,25 mg/kg or 9 mg/m^2 d 1-4 / 4-6 wks	0,18 mg/kg or 7,5 mg/m^2 d 1-4 / 4-6 wks	0,13 mg/kg or 5 mg/m^2 d 1-4 / 4-6 wks
Thalidomide	100 mg/d	50 mg/d	50 mg qod
Lenalidomide	25 mg/d d 1-21 / 4 wks	15 mg/d d 1-21 / 4 wks	10 mg/d d 1-21 / 4 wks
Bortezomib	1,3 mg/m^2 twice weekly d 1,4,8,11 / 3 wks	1,3 mg/m^2 once weekly d 1,8,15,22 / 5 wks	1,0 mg/m^2 once weekly d 1,8,15,22 / 5 wks
Prednisolone	60 mg/m^2 d 1-4 or 50 mg qod	30 mg/m^2 d 1-4 or 25 mg qod	15 mg/m^2 d 1-4 or 12,5 mg qod
Cyclophosphamide	100 mg/d d 1-21 / 4 wks or 300 mg/m^2 d1,8,15 / 4 wks	50 mg/d d 1-21 / 4 wks or 150 mg/m^2 d1,8,15 / 4 wks	50 mg/d qod d 1-21 / 4 wks or 75 mg/m^2 d1,8,15 / 4 wks

Page 15: Supportive Care

Supportive Care management should follow: Ludwig H.…Weisel K.…et al., Leukemia 2018

- **Supportive Psychooncology, Social Service and Self-help groups as needed**
- **Adequate analgetic therapy and antiinfective prophylaxis**
- **Recommend physical activity adapted to patient's condition**

- **Peripheral neuropathy[30]**

Bortezomib induced peripheral neuropathy:

– Grade 1 (paresthesias, weakness and/or loss of reflexes) without pain or loss of function → consider dose reduction by one level*
– Grade 1 with pain or Grade 2 (with no pain, but limiting instrumental activities of daily living) → dose reduction by one level*
– Grade 2 with pain, Grade 3 (limiting self care and activities of daily living) or Grade 4 → discontinue bortezomib

**Dose reduction levels: twice-weekly → once-weekly, 1,3 mg/m² → 1,0 mg/m², 1,0 mg/m² → 0,7 mg/m²*

Thalidomide induced peripheral neuropathy:

Dose should generally be limited to < 200 mg/day

– Grade 1 → dose reduction by 50%
– Grade 2 → discontinue thalidomide and restart with 50% dose reduction upon resolution to grade ≤ 1

- **Use of Bisphosphonates or Denosumab[31]**

All patients with symptomatic multiple myeloma should receive therapy with bisphosphonates (local standard: zoledronic acid) regardless of presence of osteolytic bone lesions every 4 weeks for at least 2 years. In patients with a CR, bisphosphonates can be stopped then and resumed after disease progression. In patients who still have active disease (VGPR or PR) after 2 years, bisphosphonates can be applied in 3-monthly intervals as long as no signs of disease progression are evident. In active relapse, bisphosphonate treatment should be reinitiated

Denosumab should be applicated in patients with GFR < 30 ml/min. Abrupt stop of Denosumab should be avoided. Denosumab is not approved for osteopenia due to myeloma

[30] Adapted from IMWG (Richardson et al., Leukemia 2012)
[31] Adapted from ASCO (Anderson et al., JCO 2018)

Page 16: Vaccination after autologous PBSCT*

Ab 3 Monaten nach Transplantation	
Covid-19	Jeglicher Impfstoff empfohlen; Ggf. Titer-Überprüfung
Influenza	tetravalenter Impfstoff empfohlen (besseres Ansprechen nach 2 Impfungen)
Pneumokokken	zuerst 3 Impfungen PCV13 (Prevenar®) im Abstand von je 4-6 Wochen danach 1 Impfung PPSV23 (Pneumovax®) ab frühestens 8 Wochen später
VZV	Totimpfstoff (Shingrix®) verwenden! 2 Impfungen
Ab 6 Monaten nach Transplantation	
Tetanus	3 Impfungen
Diphtherie	volle Dosis („D“) empfohlen (Kinderimpfstoff) ; 3 Impfungen
Pertussis	volle Dosis, azellulärer Impfstoff („aP“) empfohlen (Kinderimpfstoff) 3 Impfungen
Poliomyelitis	inaktivierten Impfstoff verwenden (IPV)! ; 3 Impfungen
Haemophilus influenzae Typ B	Konjugat-Impfstoff empfohlen; 3-4 Impfungen
Meningogokken	Konjugat-Impfstoff empfohlen, tetravalenter Impfstoff empfohlen (MenACYW) 1-2 Impfungen
Hepatitis B	Impfung auch (insb.) bei Z.n. Hepatitis B Infektion erforderlich 3 Impfungen; Titerbestimmung nach Abschluss der 3 Impfungen empfohlen
Ab 24 Monaten nach Transplantation	
Masern/Mumps/Röteln	1-2 Impfungen

* Patients will be given a printed version of these recommendations at discharge after autologous transplantation.

Based on: Ludwig et al. Recommendations for vaccination in multiple myeloma: a consensus of the European Myeloma Network. Leukemia 2020.