9th Bi-Annual Joyce Niblack Memorial Conference on MPNs

What Should We Expect From MPN Therapy?

Ruben A. Mesa, MD
Professor & Chairman, Division of Hematology & Medical Oncology
Deputy Director, Mayo Clinic Cancer Center
Mayo Clinic – Arizona, USA

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. **Understand that not all MPN patients are impacted the same**

MAYO CLINIC
Cancer Center

Assessing MPN Burden

WHO Diagnosis Does Not Tell Whole Story

Vascular Events
- PV/ET > MF
- Counts matter
- Can be unrecognized

Baseline Health
AGE/ Medicines
Comorbidities

Cytopenias
- MF> ET/PV
- Anemia
  - MF 75%
  - TX Dep 25%
- TPN 30%

Progression
- PV/ET to MF
- PV/ET to AML
- MF to AML
- ? 2nd MDS

Splenomegaly
- MF> ET/PV
- Pain not always a function of size

MPN Symptoms
- MF>PV>ET
- Multifactorial
- Some ET/PV > MF
- Cytoreductive rx frequently not effective

MAYO CLINIC
Cancer Center

What Should We Expect From MPN Therapy?

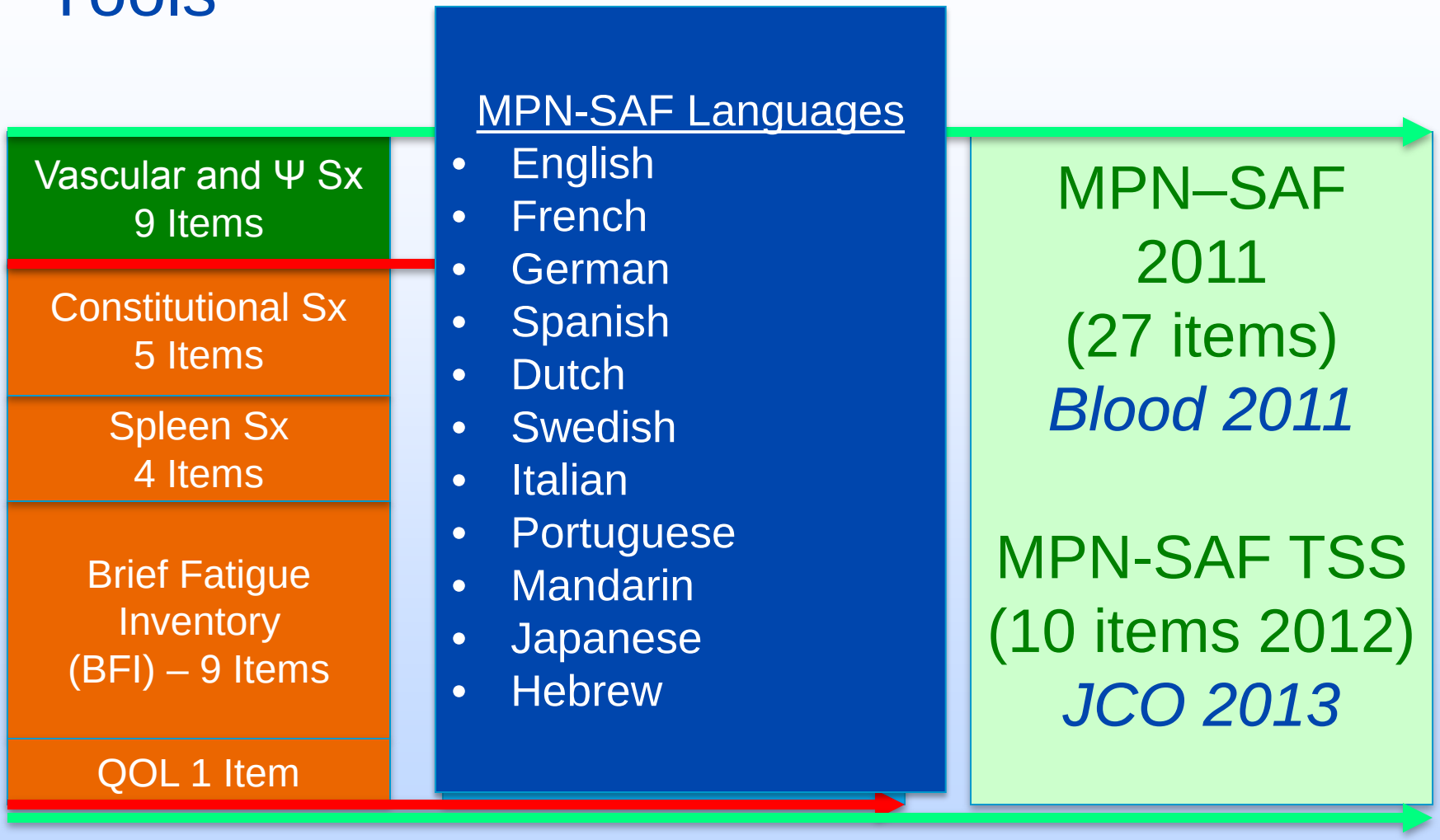
Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

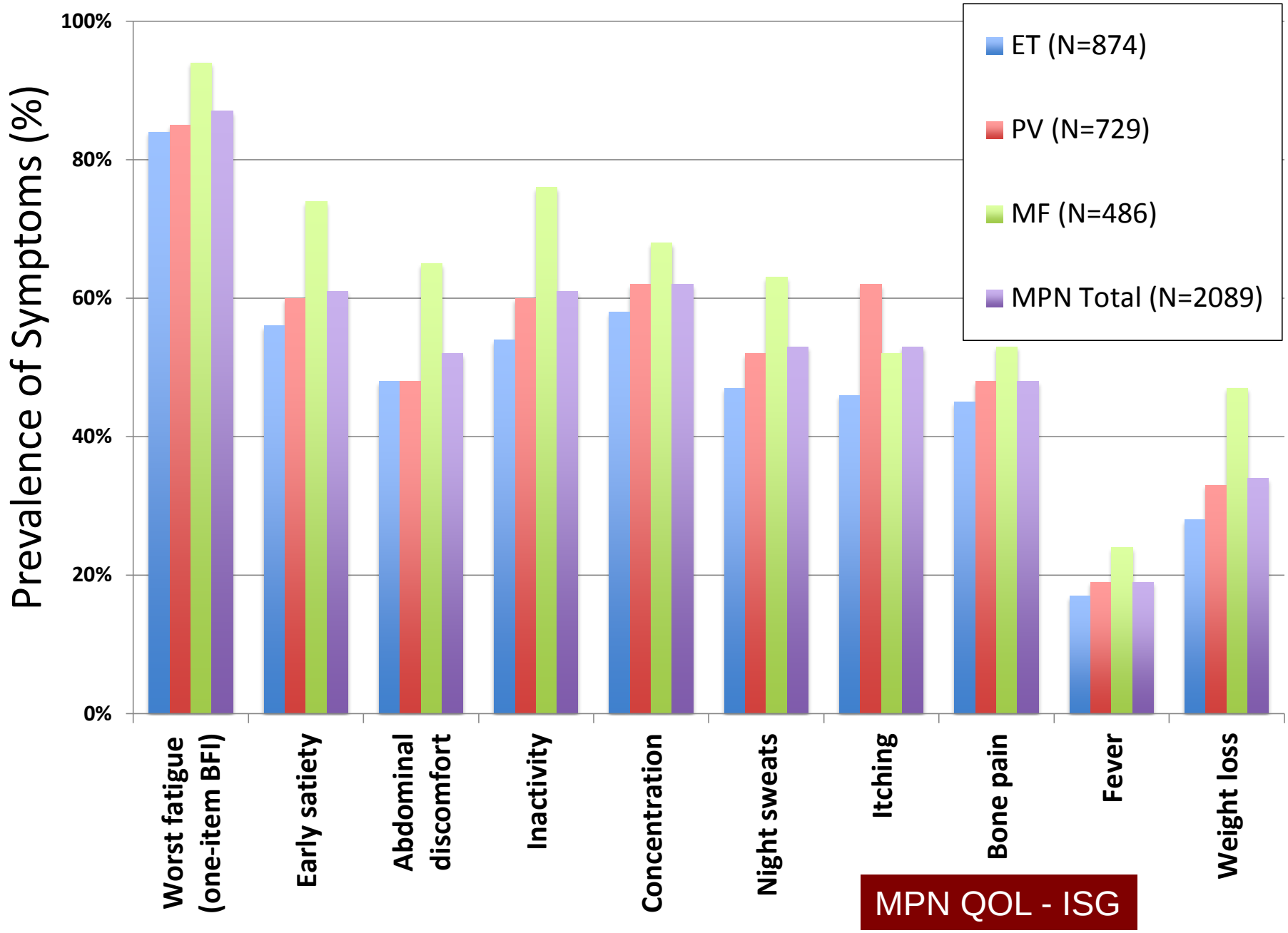
9. Understand the spectrum of symptoms MPN patients face

MAYO CLINIC
Cancer Center

Evolution of MPN Symptom Assessment Tools



Symptoms from 2089 MPN Patients Using the MPN-SAF TSS (MPN10)



MPN QOL - ISG

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

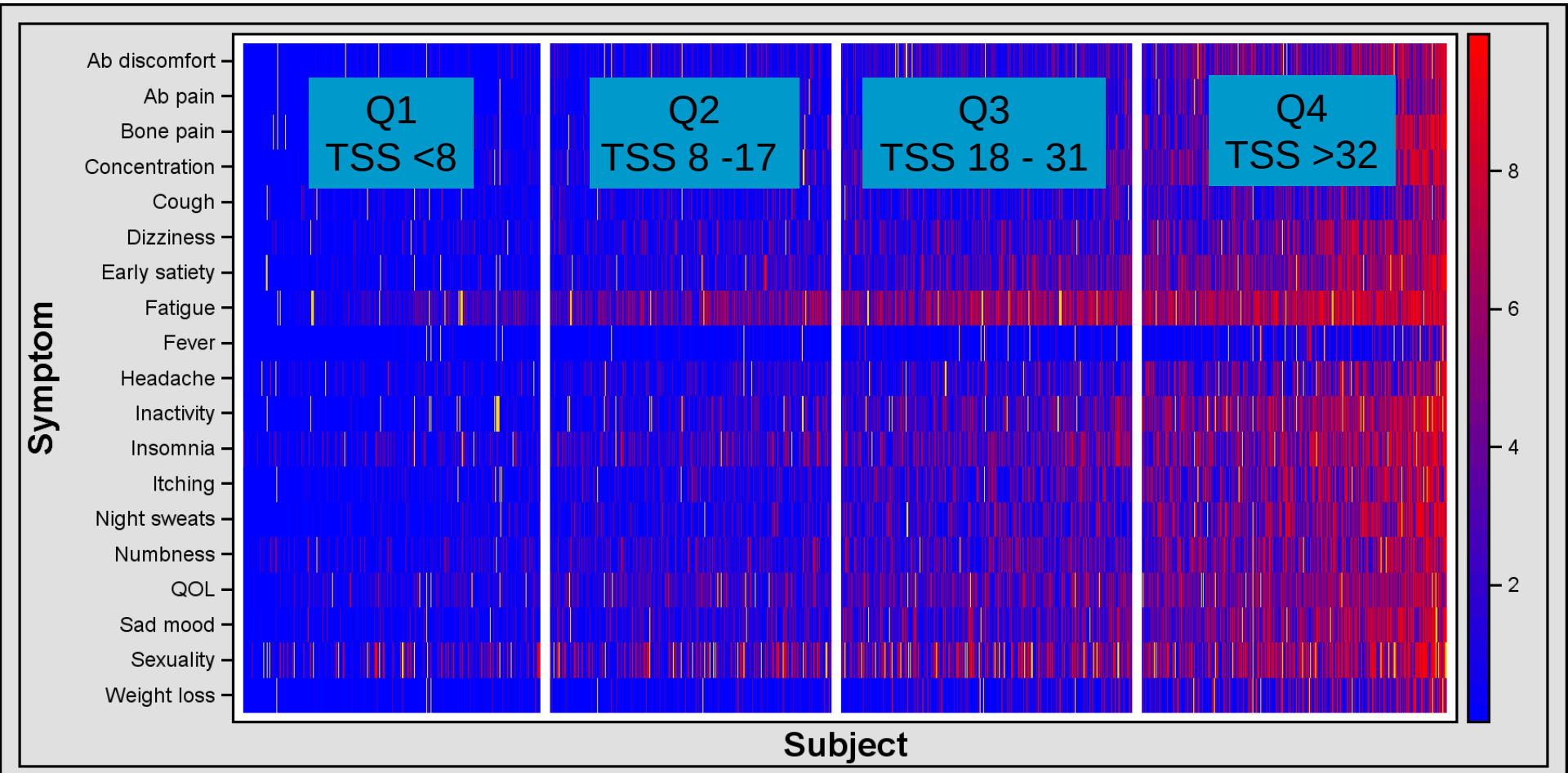
9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

MAYO CLINIC
Cancer Center

MPN Symptom Burden by Quartiles

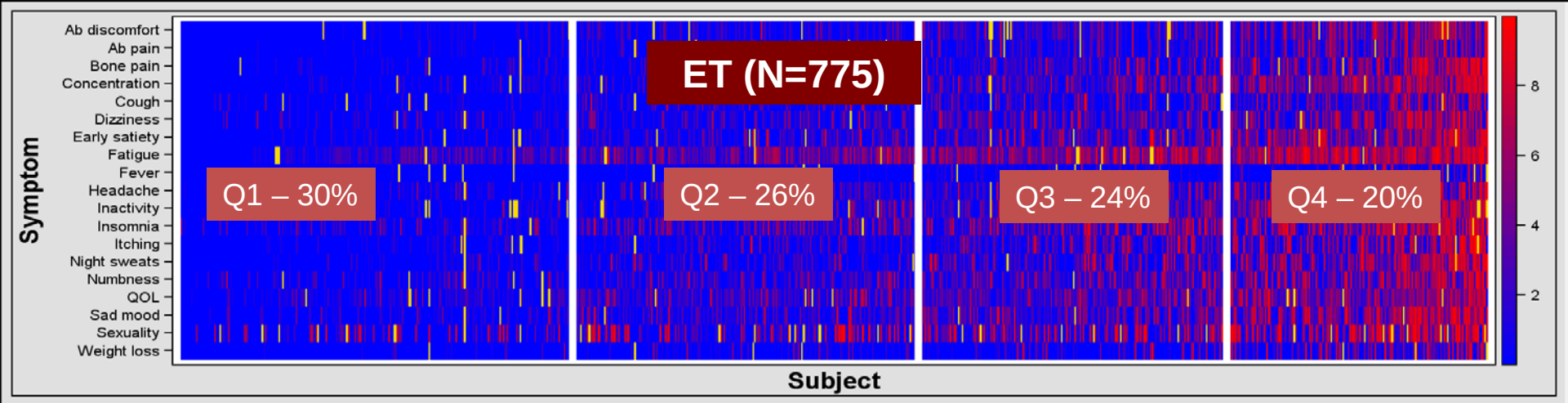
1858 MPN-SAF Respondents

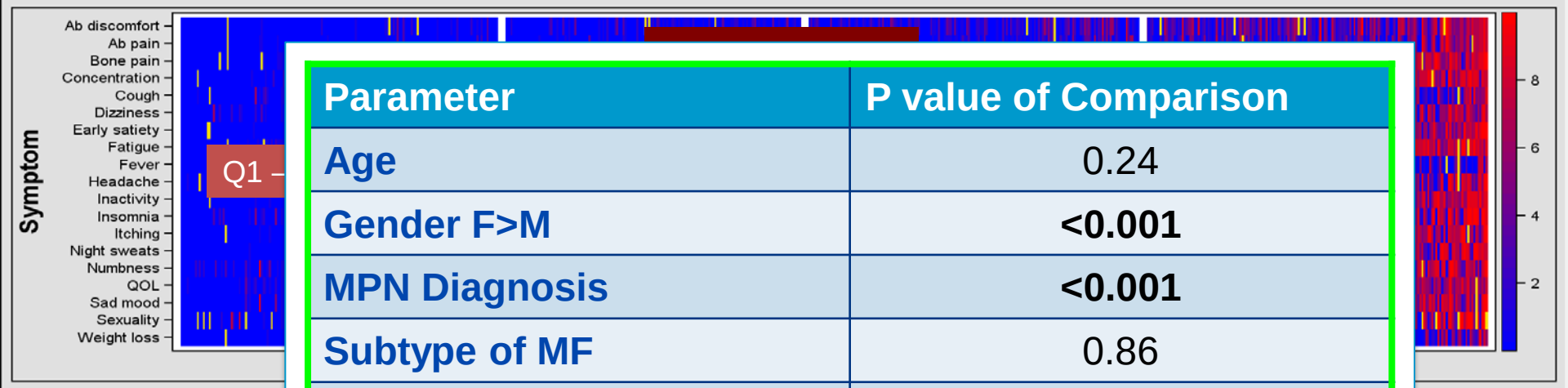


MAYO CLINIC
Cancer Center

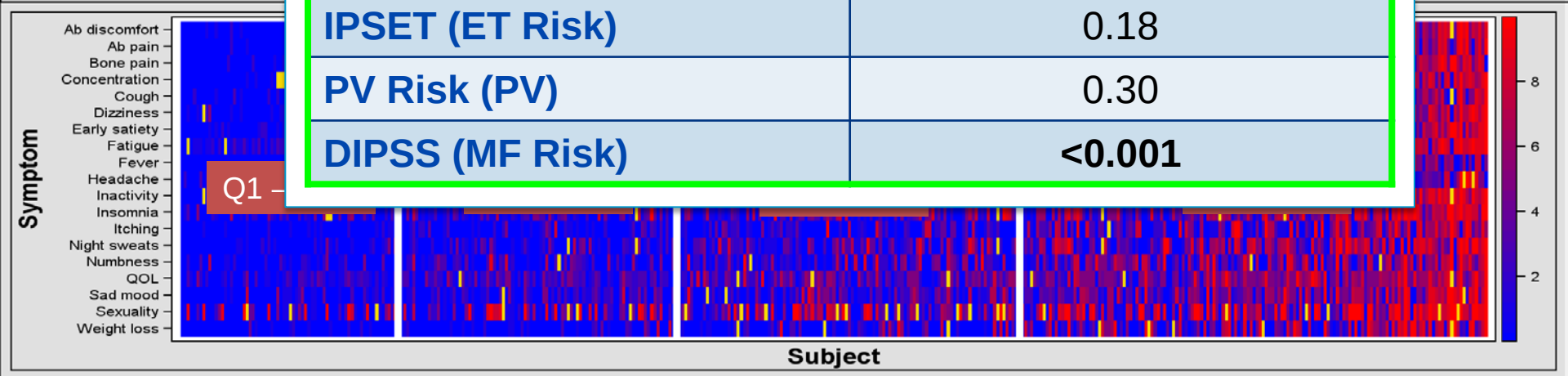
Quartile 1 (Q1): 0-24%
Quartile 2 (Q2): 25-49%
Quartile 3 (Q3): 50-74%
Quartile 4 (Q4): 75-100%

Scherber et.al.
ASH 2013





Parameter	P value of Comparison
Age	0.24
Gender F>M	**<0.001**
MPN Diagnosis	**<0.001**
Subtype of MF	0.86
IPSET (ET Risk)	0.18
PV Risk (PV)	0.30
DIPSS (MF Risk)	**<0.001**



Results

Females

- **Lower rate of thrombocytopenia (8% vs 14%, p<0.001).**
- **Higher TSS (adjusted mean 23.9 vs 20.6; p<0.001)**
- **Higher symptom scores for 15/18 items**
- **Prominent symptoms: *fatigue, bone pain, abdominal discomfort, and microvascular related***

Males

- **Higher mean age than females (mean 60.7 yrs [SD 12.6] vs 59.3 yrs [SD 14.4]; p=0.02)**
- **Higher rate of requirement for red blood cell transfusion (7% vs 5%, p=0.02)**
- **Higher mean white blood cell count (mean 9.5x10^9/L [SD 8.2 x10^9/L] vs mean 8.5 x10^9/L [SD 6.1x10^9/L]; p=0.004)**

Females demonstrate…

Higher levels of fatigue

- Younger
- Lower red blood counts
- Lower transfusion rates

More Abdominal Symptoms

- Male=female abdominal thrombosis rates

Microvascular symptoms

- Previous reports show more macrovascular symptoms

Higher Symptom Scores

- Individual SS and TSS
- Male=female QOL score

MAYO CLINIC
Cancer Center

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

MAYO CLINIC
Cancer Center

MPN "Fatigue" Project 2014
Collaborative Internet Based Trial with MPN Forum

ANY MPN Patient
- Survey online
- MPN Forum
- MPN Advocacy
- MPN Research Foundation
- CMPD Ed Foundation

Register/ Online Consent

Online 70 Item Survey
- Demographics
- MPN History
- MPN-SAF (MPN10)
- Brief fatigue inventory (BFI)
- Profile of mood states (POMS-Short)
- Patient Health Questionnaire (PHQ-2)
- Mental Health Inventory (MHI-5)

Patients

1788 MPN patients/ 1676 Eval.

ET 33%, PV 39%, MF 25%

68% Female, median age 59. MPN10 Score average 28.4 (range 0-83)

Psych Comorbidity

23% high likelihood of depression (≥ 3 on PHQ-2)

Prior diagnosis depression (32%), anxiety (29%), stress (26%), grief (15%)

22% on therapy for mood disorder in last 6 months

MPN Correlation

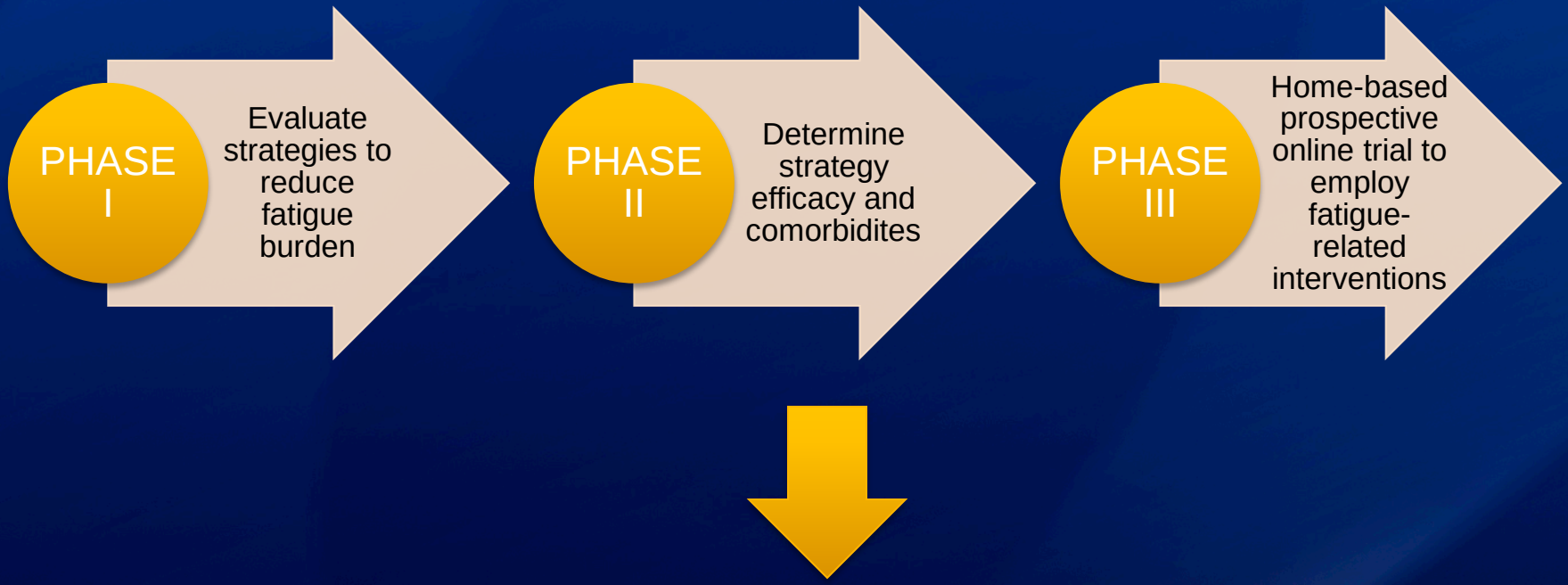
Higher BFI, MPN-SAF, MPN10 scores all correlated with increased depressive symptoms ($p<0.0001$)

MAYO CLINIC
Cancer Center

Scherber R et al. 2014, ASH: abstract 3173

MPN Fatigue Project

- Three part project:



N=1748 MPN pts (718 PV, 625 ET, 420 MF, 29 other)

MAYO CLINIC

Fatigue Project

Strategies To Cope with Fatigue Related to MPN	BFI - Mean (SD), N YES	BFI - Mean (SD), N NO	*Δ*	95% CI	*P*
Postponing non-essential activities	5.0 (2.1), 981	3.2 (2.3), 365	1.8	(1.6, 2.1)	<.0001
Setting priorities	[illegible] (2.1), 1015	[illegible]	[illegible]	[illegible] (1.3, 1.9)	<.0001
Medication psychostimulants	[illegible] (2.0), 110	4.4 (2.3), [illegible]153	[illegible]	[illegible] (1.0, 1.8)	<.0001
Antidepressants	[illegible] (2.0), 320	4.2 (2.5), 1050	1.3	(1.1, 1.6)	<.0001
Delegation	[illegible] (2.2), 682	3.9 (2.4), 655	1.1	(0.8, 1.3)	<.0001
Scheduling of activities to times of peak energy	[illegible] (2.1), 827	3.8 (2.4), 828	1.1	(0.8, 1.3)	<.0001
Naps	[illegible], 942	[illegible]	1.1	(0.8, 1.3)	<.0001
Labor-saving devices	[illegible] (2.1), 493	4.1 (2.4), 838	1	(0.8, 1.2)	<.0001
Structured daily routines	5.0 (2.2), 706	[illegible]	[illegible]	[illegible].2)	<.0001
Socializing with family or friends	4.8 (2.2), 853	3.9 (2.5), 487	1	(0.7, 1.2)	<.0001
Support groups	5.3 (2.1), 296	[illegible]	[illegible]	[illegible].8, 1.3)	<.0001
Pacing	4.9 (2.1), 772	4.0 (2.4), 980	0.9	(0.7, 1.2)	<.0001
Reading	4.8 (2.2), 820	3.9 (2.4), 523	0.9	(0.6, 1.1)	<.0001
Sleep therapy	5.3 (2.1), 117	4.4 (2.3), 1237	0.9	(0.5, 1.4)	<.0001
Music	[illegible] (2.2), 618	4.1 (2.3), 722	0.8	(0.5, 1.0)	<.0001
Church or spiritual activities	[illegible].1), 485	4.2 (2.4), 841	0.8	(0.5, 1.0)	<.0001
Nutrition	[illegible], 876	4.0 (2.4), 499	0.8	(0.5, 1.1)	<.0001
Steroids	[illegible].0), 75	4.5 (2.3), 1282	0.8	(0.3, 1.4)	0.003
Meditation, quiet time, or cognitive re-framing	[illegible].2), 555	[illegible]	0.7	(0.4, 0.9)	<.0001
New activities/ diversions	[illegible].3), 476	4.3 (2.3), 857	0.5	(0.2, 0.7)	0.0003
Relaxation, including yoga	[illegible].3), 572	4.3 (2.4), 821	0.4	(0.1, 0.6)	0.005
Walking/sitting in a natural environment	[illegible].2), 891	4.3 (2.5), 477	0.2	(-0.02, 0.5)	0.1
Gardening	4.6 (2.3), 585	4.4 (2.4), 788	0.1	(-0.1, 0.4)	0.3
Volunteer activities	4.5 (2.3), 430	4.5 (2.3), 937	0.1	(-0.2, 0.3)	0.7
Exercise	4.4 (2.3), 1009	4.7 (2.5), 377	-0.4	(-0.6, -0.1)	0.01

Postponing non-essential activities

Setting priorities

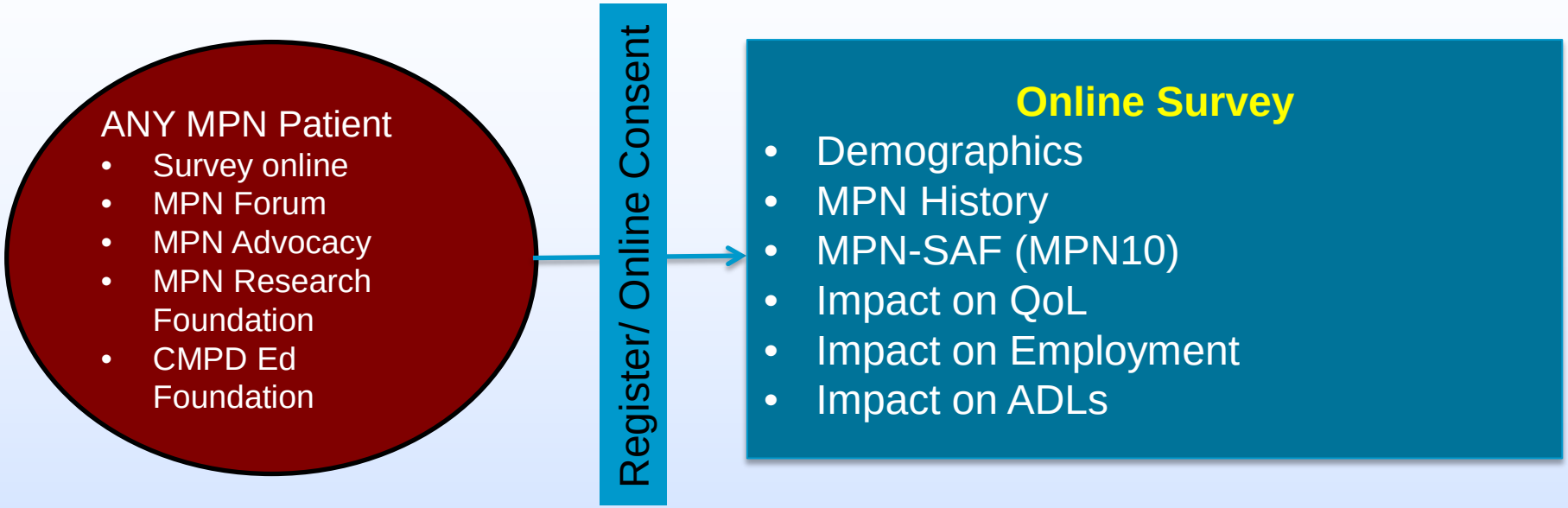
Medication Psychostimulants

Antidepressants

Exercise

MAYO CLINIC

MPN Patient Burden- Disease Impact
2014 Landmark Study



Patients

- 813 MPN Patients
  - MF (207)/ PV (380), ET (226)
  - INT/ High Risk
    - MF (94%)
    - PV (78%)
    - ET (74%)

Symptom Burden

- Anxious about their MPN
  - MF (91%)
  - PV (78%)
  - ET (74%)
- MPN Symptoms decrease my QoL
  - MF (81%)
  - PV (66%)
  - ET (57%)

Impact

- ≥ 1 sick day in last month
  - MF (33%), PV (23%), ET (22%)
- ≥ 1 cancelled activity in last month
  - MF (46%), PV (35%),
  - ET (34%)

MAYO CLINIC
Cancer Center

Mesa R et al. 2014, ASH: abstract 3183

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

MAYO CLINIC
Cancer Center

Monitoring MPNs

Evolving MPN prognostic scales

	IPSET (ET—3 groups) *Survival thrombosis risk*	PV Risk (4 groups) *Survival leukemia rates*	DIPSS (PMF—4 groups) *Survival*
Age, years	≥ 60 (2 pts) vs < 60	≥ 67 (5 pts) 57-66 (2 pts), < 60 (0)	≥ 65 (1 pt) vs < 65
Leukocytes	≥ 11 (1 pt) vs < 11 x 10^9/L	≥ 15 (1 point) vs < 15 x 10^9/L	> 25 (1 pt) vs ≤ 25 x 10^9/L
Hemoglobin			< 10 (2 pts) vs ≥ 10 g/dL
Constitutional symptoms			Present[a] (1pt) vs absent
Blasts			≥ 1% (1pt) vs < 1%
Prior thrombosis	Yes (1 point) vs No	Yes (1 Point) vs No	
Risk group point cutoffs	0; 1-2; 3-4 pts	0; 1-2; 3; 4 pts	0; 1-2; 3-4; ≥ 4 pts
	Passamonti Blood 2012	*Tefferi Leuk 2014*	*Passamonti Blood 2010*

[a] 10% weight loss over prior 6 months, night sweats, unexplained fever.

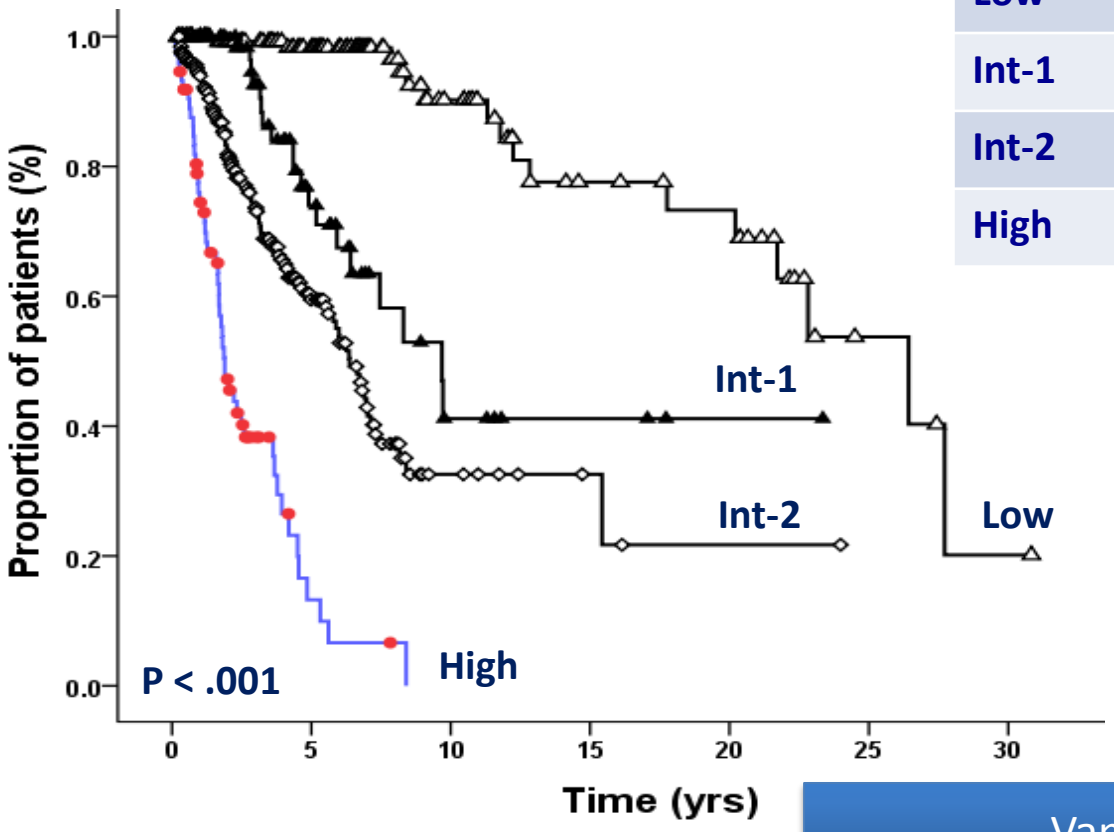
MIPSS: Molecular International Prognostic Score System

MULTIVARIATE ANALYSIS			Weighted value
Variables	HR (95% CI)	P	
Age >60yrs	3.8 (2.60-5.51)	<0.0001	1.5
Hb <100g/L	1.4 (1.01-1.99)	0.04	0.5
Constitutional Symptoms	1.5 .(1.13-2.16)	0.007	0.5
PLT <200x10^9/L	2.5 (1.77-3.42)	<0.0001	1.0
Triple Negativity	3.9 (2.20-6.80)	<0.0001	1.5
JAK2/MPL mutation	1.8 (1.11-2.90)	0.016	0.5
ASXL1 mutation	1.4 (1.06-1.99)	0.02	0.5
SRSF2 mutation	1.7 (1.08-2.58)	0.02	0.5

Vannucchi et. al. ASH 2014

Development of the MIPSS Score in the Learning Cohort

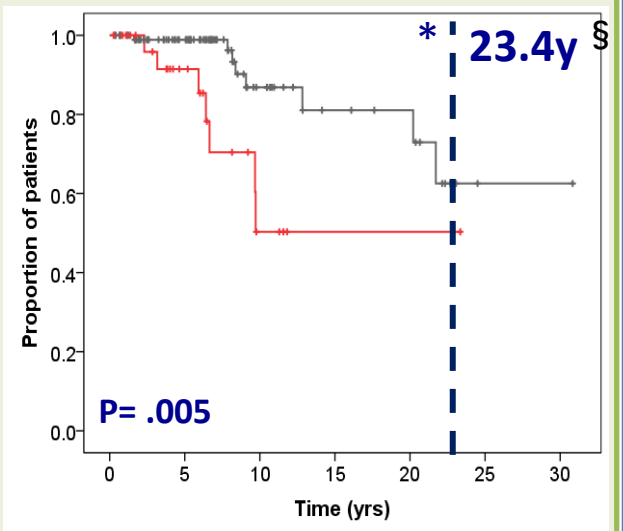
Risk category	Score	% of pts	OS (y)	HR
Low	0-0.5	27	26.4	1
Int-1	1-1.5	14	9.7	4.7
Int-2	2-3.5	46	6.4	9.9
High	≥4	13	1.9	36.5



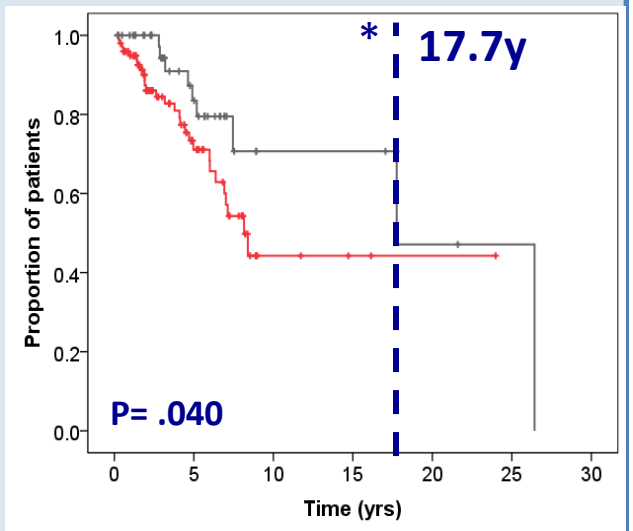
Vannucchi et. al. ASH 2014

MIPSS Permits to Refine Prognostic Stratification Within the IPSS Categories

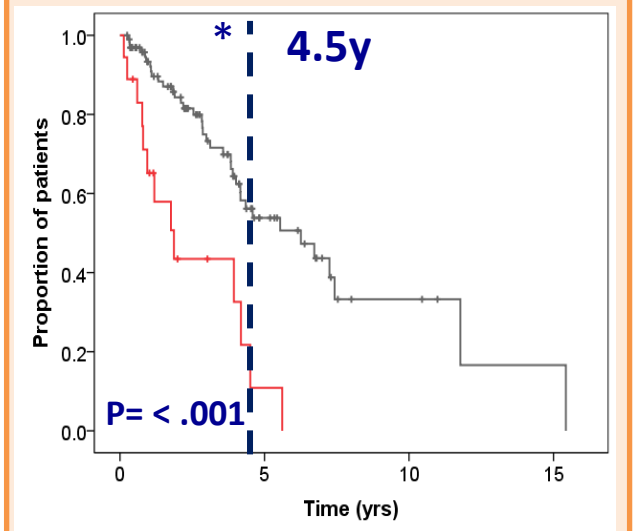
IPSS - LOW



IPSS - INT-1



IPSS - INT-2



Low 24.9y §	≤ Int-1 17.7y	≤ Int-2 6.2y
> Low 15.3y §	> Int-1 8.1y	> Int-2 1.9y

§Estimated

MIPSS

*, IPSS Median Survival – – – – –

Vannucchi et. al. ASH 2014

FATIGUE Trial – Co-morbidities in 1676 MPN Patients

Fatigue-related Category	Percent Respondents (N=1676)	Correlation with fatigue score (P-value)
Chronic Illness		
Hypothyroidism	12.9%	
Restless leg syndrome	7.0%	
Heart failure	6.1%	
Obstructive sleep apnea	4.0%	
Rheumatologic disease	3.8%	
Diabetes Mellitus	3.6%	
Fibromyalgia	3.4%	
Chronic lung disease	2.9%	
Chronic fatigue syndrome	1.7%	
Chronic kidney disease	1.6%	
Liver failure	0.6%	
Current Medication Use Categories		
Blood pressure	32.1%	NS*
Antidepressants	16.0%	<0.001
Antihistamines	16.0%	0.0276
Anti-anxiety	10.1%	0.0357
Prescription pain	7.8%	<0.001
Steroids	3.4%	NS*
Cough or cold medications	1.8%	NS*

Scherber et. al. ASH 2014

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

5. Understand new response criteria, and need for their validation

MAYO CLINIC
Cancer Center

Response Criteria for MPNs 2014 (All ≥ 12 Weeks)

ET/PV – ELN (Barosi et. al. *Blood 2013*) MF – IWG-MRT (Tefferi et. al. *Blood 2013*)

	Complete Remission	Partial Remission	Clinical Improvement	Other
ET	• Resolve ET Signs • ≥ 10 pt. MPN10 ↓ • Near normal counts • No Prog. or Vascular • BM rem & ≤Gr 1 MF	• Resolve ET Signs • ≥ 10 pt. MPN10 ↓ • Near normal counts • No Prog. or Vascular		Peripheral Blood Granulocytes • CR – Eradicated mutation • PR - ≥50% ↓, *≥ 20% baseline*
PV	• Resolve PV Signs • ≥ 10 pt. MPN10 ↓ • Near normal counts • No Prog. or Vascular • BM rem & ≤Gr 1 MF	• Resolve PV Signs • ≥ 10 pt. MPN10 ↓ • Near normal counts • No Prog. or Vascular		Peripheral Blood Granulocytes • CR – Eradicated mutation • PR - ≥50% ↓, *≥ 20% baseline*

MF	• Resolve MF Signs
	• Resolve MF sympts
	• Near normal counts
	• BM rem & ≤Gr 1 MF
		Like MF CR but
		• Hb (between 85 and 100 g/L)
		• PLT (between 50-100 x 10(9)/L)
			• Anemia (2g/dl or T.I.)
			• Spleen (Based on BL)
			• Symptoms (≥ 50%↓)
				• Molecular (ET/PV Criteria)
				• Cytogenetic
				  • CR – Normal
				  • PR - ≥ 50%↓

N.B. ET/PV – Progression is MF/MDS/ or AML
MF – Progression based on spleen growth or AML

MAYO CLINIC
Cancer Center

"Clinically Meaningful" – What is Valid?
(Example – Spleen Reduction)

> 50% reduction of Palpable Length ← IWG-MRT 2006 Blood 2006

> 35% Volume Reduction by MRI ← COMFORT 1 & 2 NEJM 2012

> 10% Volume Reduction by MRI
- Better Survival and PGIC

← Pooled CI/CII Blood 2013

MAYO CLINIC
Cancer Center

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

5. Understand new response criteria, and need for their validation

4. Optimizing the timing and utilization of stem cell transplant

MAYO CLINIC
Cancer Center

Stem Cell Transplant Use in MPNs

Baseline Assumptions/ Caveats

- **SCT *almost* exclusively for MF/ MPN-BP**
- **In MF evolving risk/benefit analysis for use**

Question 2

Pre Transplant Therapy?

- JAK Inhibition?
- Cytoreduction?
- Iron chelation?

"Problematic" MF & SCT Eligible

Allo SCT

Question 1

Timing?

- Urgent
- Delayed
- Never

Question 3

Post Transplant Therapy?

- JAK Inhibition?
- Interferon?
- other?

MAYO CLINIC
Cancer Center

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

5. Understand new response criteria, and need for their validation

4. Optimizing the timing and utilization of stem cell transplant

3. Optimizing the utilization of current available agents

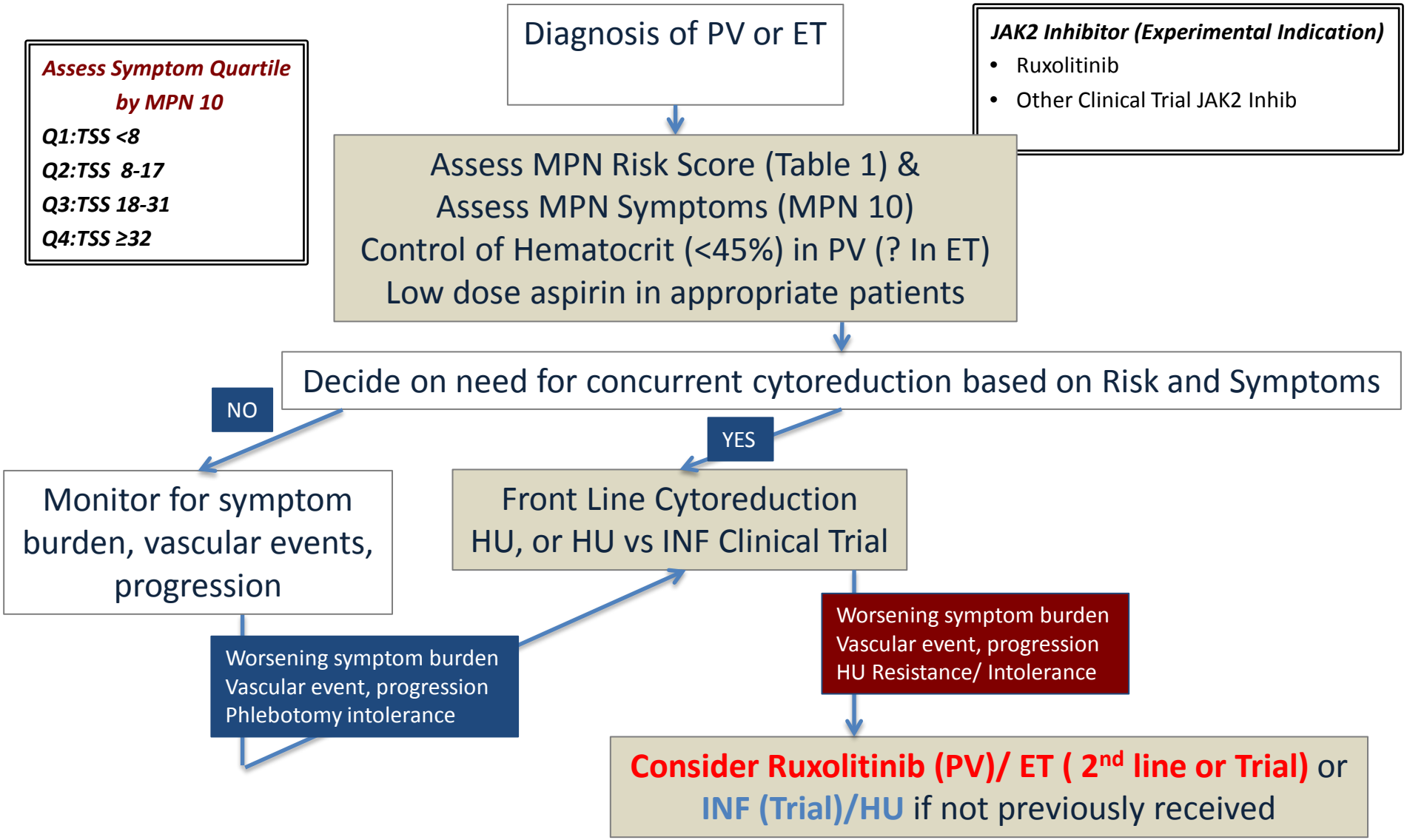
Primary Commercially Available MPN Drugs 2015

	Hydroxyurea	Interferon/ Peg -INF	Anagrelide	Ruxolitinib
ET	XXX	XX	XX	X
PV	XX	XX	X	XXX
MF	X	X	X	XXX

MAYO CLINIC
Cancer Center

EXPERIMENTAL – OFF LABEL – PHASE III DATA

Proposed Algorithm of Therapy of ET/PV in 2015



Proposed Algorithm of Therapy of MPN-MF in 2015

N.B.
Consider Rx for Prevention of Vascular Events in Appropriate Patients (Aspirin & Cytoreduction)

Symptom Quartiles by MPN 10
Q1:TSS <8 ***Q3:TSS 18-31***
Q2:TSS 8-17 ***Q4:TSS ≥32***

Diagnosis of MPN-MF (Primary, Post ET or Post PV Myelofibrosis)

Calculate DIPSS MF Score & Assess MPN Symptoms (MPN 10)

JAK2 Inhibitors
- Ruxolitinib (Jakafi/Jakavi)

(Approved for MF)
- Clinical Trial JAK2 Inhib

Anemia Rx
- Clinical Trials
- IMID/ Androgens/ EPO
- Splenectomy

Low Risk
Med S = 185m
Symptom Q1-Q2

Observation vs INF (Trial)

Low Risk
Med S <185m
Symptom Q3-Q4

Possible Role Of JAK2 Inhib (Trial) or INF (Trial)

Intermediate to High Risk
Med S = 16m (H), 35m (Int 2), 78 (Int 1)
Assess role and timing of ALLO SCT (Donor, Risk, Candidate)
ALLO – Urgent, Delayed, Never

Urgent ALLO → Proceed to ALLO (Possible JAK2 Inhib Prior) (Trial)

Delayed/Never ALLO → JAK2 Inhibitor*
*Unless anemia/ cytopenias main problem

JAK2 Single Agent Failure Refractory Cytopenias → Clinical Trials
- Ruxo Combination
- Non Ruxo JAK2
- New Targets

What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

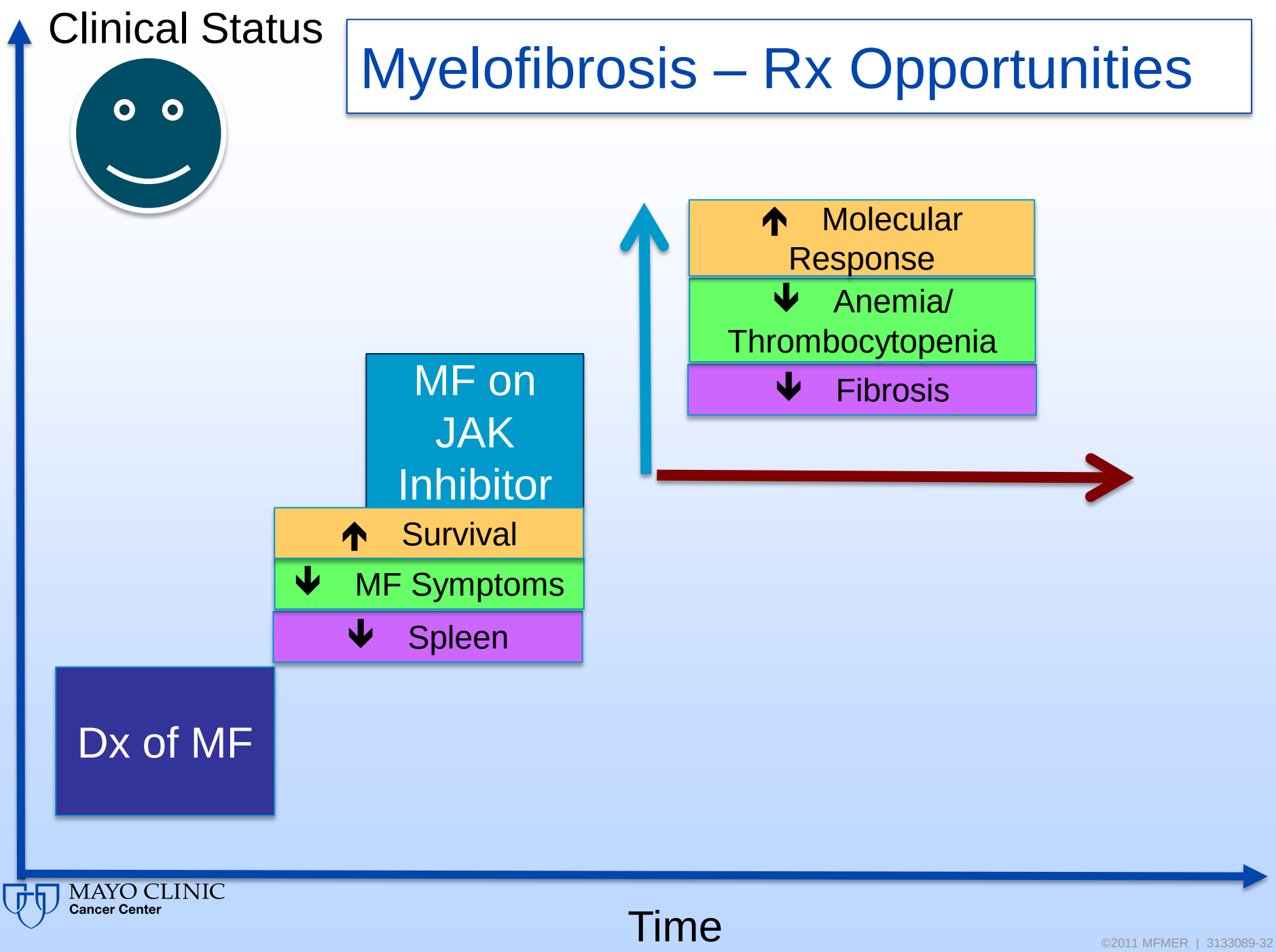
5. Understand new response criteria, and need for their validation

4. Optimizing the timing and utilization of stem cell transplant

3. Optimizing the utilization of current available agents

2. Thoughtful analysis of combination MPN therapeutic approaches

Myelofibrosis – Rx Opportunities



MAYO CLINIC
Cancer Center

Interferons in MPNs – Evolving Footprint

Peginterferon alpha–2a

MPD – RC 112
PEG IFN vs HU
(Front Line)
High Risk ET/PV
NCT01258856

MPD-RC 111
PEG IFN
(2nd Line)
High Risk ET/PV - SVT
NCT01259817

Pegylated P Interferon alpha-2b
AOP 2014 P1101

PROUD - PV
AOP2014/P1101 vs HU
(Front Line)
High Risk PV
NCT01949805

MAYO CLINIC
Cancer Center

LANDSCAPE MPN Clinical Trials 2015

ET/PV

- PEG INF vs HU MPD-RC 112 NCT01258856
- PEG INF (2nd Line) NCT01259817
- P1101 vs HU (PV) AOP NCT01949805
- Ruxolitinib (PV) Response 1,2 Relief Trials
- Momelotinib NCT01998828
- Givinostat (HDAC) NCT0190432

Single Agent MF

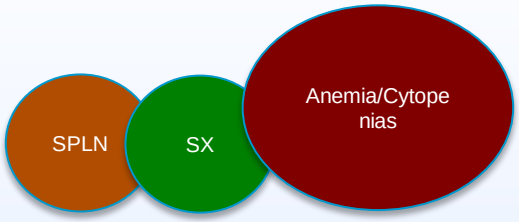
- Pacritinib v BAT (PERSIST1-PH III) NCT01773187
- Pacritinib v. BAT (PERSIST2- PH III) NCT02055781
- Momelotinib v. Rux (PH III) NCT01969838
- Momelotinib vs. BAT (PH III) NCT012101268
- NS-018 (PH II) NCT01423851
- Imetelstat
- PF04449913 (Smo) NCT02226172

Combination MF Rux Plus -

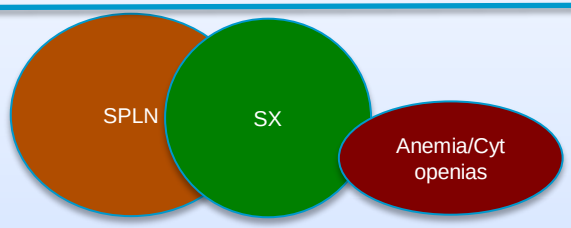
- Lenalidomide NCT013575140
- Pomalidomide NCT01644110
- Danazol NCT01732445
- Azacitidine NCT01787487
- Decitibine NCT02076191
- PRM-151 NCT01981850
- Panobinostat NCT01693601 NCT01433445
- BKM 120 (Pi3K) NCT01730248
- LDE 225 (HH) NCT01787552

Different phenotypes in setting of JAK inhibition

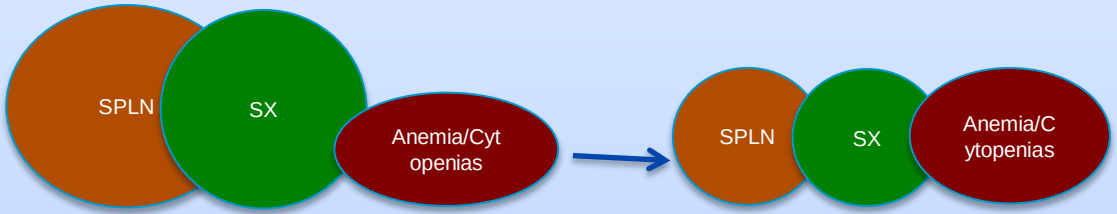
Primary anemia phenotype



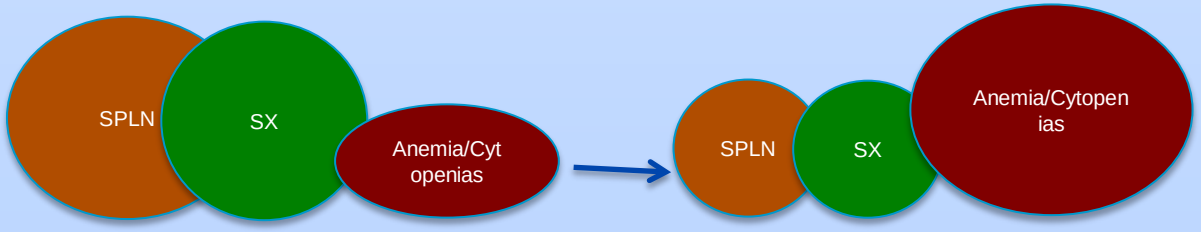
Proliferative phenotype



Good ruxolitinib response

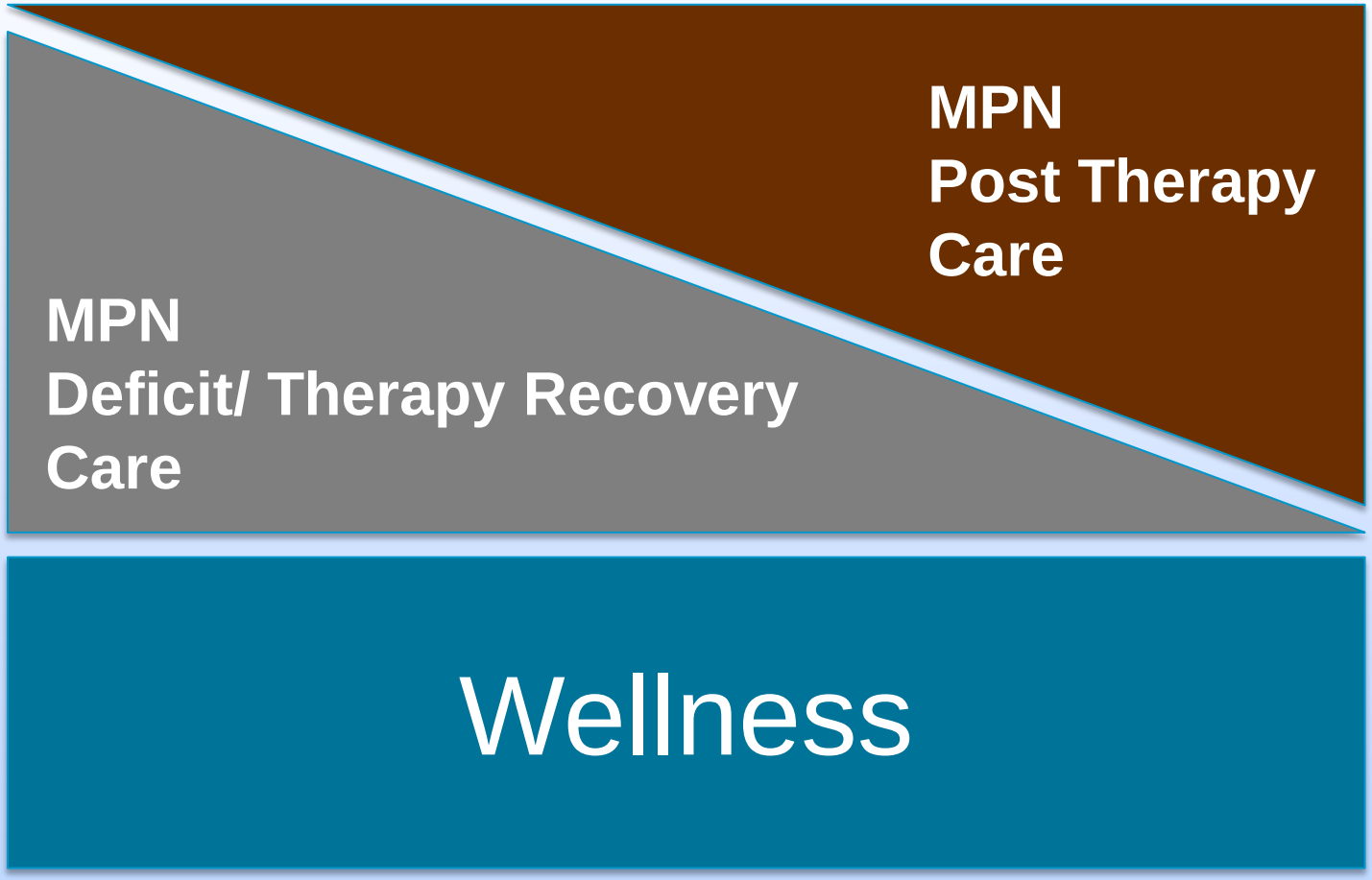


Ruxolitinib response with anemia a problem



MAYO CLINIC Cancer Center

MPN Patient Supportive and Survivorship Care



What Should We Expect From MPN Therapy?

Top 10 ways we better match therapy and patients

10. Understand that not all MPN patients are impacted the same

9. Understand the spectrum of symptoms MPN patients face

8. Understand impact of symptom clusters, and gender effect on MPN patients

7. Understand the complex issue of MPN fatigue, and possible mood disorders

6. Understand complex assessment of MPN “risk”, and comorbidities

5. Understand new response criteria, and need for their validation

4. Optimizing the timing and utilization of stem cell transplant

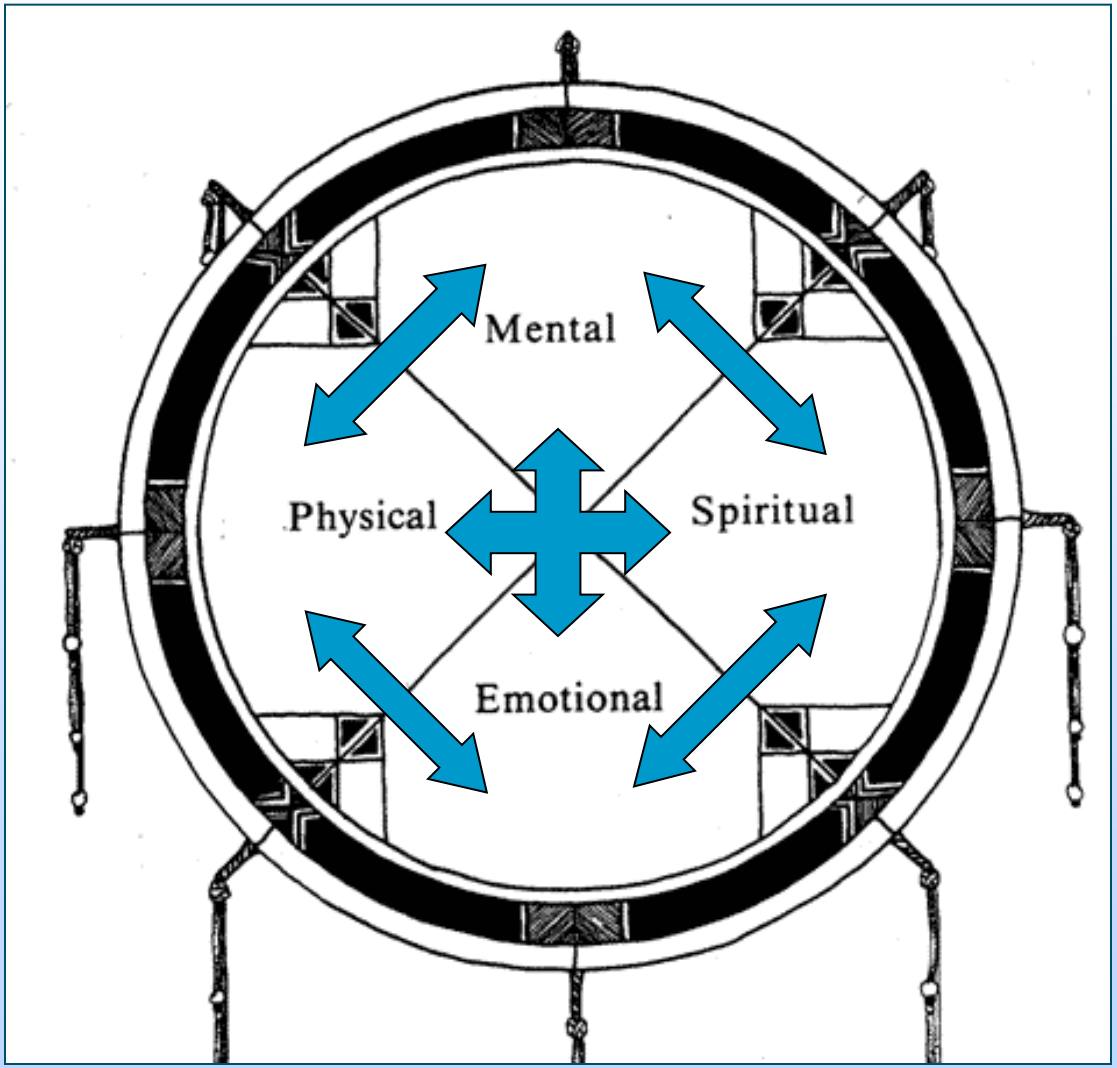
3. Optimizing the utilization of current available agents

2. Thoughtful analysis of combination MPN therapeutic approaches

1. Never lose the forest through the trees

MAYO CLINIC
Cancer Center

Medicine Wheel of Health
"Integrative Medicine"



Being a Blood Disease Survivor
Top 10 List

10. Learn about your disease
9. Make friends with facing a similar challenge
8. Be your own best advocate
7. Capture what is discussed at doctors visits (friends/ recorder)
6. Take care of your caregiver
5. Take care of the rest of your health
4. Eat in a healthy way (most of the time☺)
3. Exercise
2. Live every moment
1. Focus on relationships

MAYO CLINIC
Cancer Center

Quotes from Erma Bombeck
Written as she was dying from Cancer

- If I had my life to live over I would…

- Have gone to bed when I was sick instead of pretending the earth would go into a holding pattern if I weren't there for a day

I would have...

- Burned the pink candle sculpted like a rose before it melted in storage

I would have...

- Sat on the lawn with my grass stains

I would have...

- Talked less and listened more

I would have...

- Invited friends over to dinner even if the carpet was stained or the sofa faded

I would have...

- Shared more of the responsibility carried by my husband

I would have...

- Never have insisted the car windows be rolled up on a summer day because my hair had just been teased and sprayed

I would have...

- Don’t worry about who doesn’t like you, who has more or who is doing what. Instead, cherish the relationships we have with those who do love us.

I would have...

- Never have bought anything just because it was practical, wouldn’t show soil, or was guaranteed to last a lifetime

I would have...

- Instead of wishing away nine months of pregnancy, I'd have cherished every moment and realized that the wonderment growing inside me was the only chance in life to assist God in a miracle

I would have...

- Taken the time to listen to my grandfather ramble about his youth

I would have...

- Cried and laughed less while watching TV and more while watching life

I would have...

- But mostly, given another shot at life, I would seize every minute… look at it and really see it… live it and never give it back. Stop sweating the small stuff.

MAYO CLINIC
Cancer Center


MAYO CLINIC
Mayo Clinic
Myeloproliferative Neoplasm (MPN) Team
Arizona, USA
Dr. Emanuel
Dr. Sproat
Dr. Tibes
Dr. Camoriano
Dr. Mesa
Dr. Fauble
Dr. Noel
Dr. Dueck
D. Combs, RN
D. Seaders, PA
E. Knight, RN
Dr. Valdez
Dr. Gowin
Dr. Geyer
Dr. Conley
K. Lee, RN
A. Skeens, RN

MPN-QOL
INTERNATIONAL STUDY GROUP

Acknowledgements

Argentina
Ana Clara Kneese, MD
Federico Sackmann, MD
Australia
David M Ross MBBS, PhD
Cecily Forsyth
John Seymour, MBBS, PhD
Karen Hall, MD
Kate Burbury MD
Tam Constantine, MD
Canada
Lynda Foltz, MD
Vikas Gupta, MD
China
Hsin-An Hou, MD
Huan-Chau Lin,
MD Hung Chang, MD
Ming-Shen Dai, MD
Yuan-Bin Yu, MD
Yung-Chen Su, MD
Zhijian Xiao, MD
Denmark
Christen Lykkegaard Andersen, MD
Hans Hasselbalch, MD
France
Brigitte Dupriez, MD
Jean-Jacques Kiladjian, MD
Jean-Loup Demory MD
Magali Demilly, PhD
Germany
Heike L. Pahl, PhD
Ireland
Mary Francis McMullen, MD
Israel
Martin Ellis, MD
Italy
Alessandro M. Vannucchi, MD
Francesco Passamonti, MD
Giovanni Barosi, MD
Tiziano Barbui, MD
Netherlands
Harry Schouten, MD, PhD
Jan Jacques Michiels, MD
Karin Klauke, MD
Peter te Boekhorst, MD
Sonja Zweegman, MD PhD
Stephanie Slot, MD
Suzan Commandeur, MD
New Zealand
Hilary Blacklock, MD
Panama
Francis Guerra, MD
Singapore
Wee Joo Chng, MB ChB
Spain
Ana Kerguelen Fuentes, MD
Carlos Besses, MD
Francisco Cervantes, MD
Dolores Fernandez-Casados
Sweden
Andreasson Bjorn, MD
Elisabeth Ejerblad, MD
Gunnar Birgegard, MD
Jan Samuelsson, MD
Johanna Ablesson, MD
Peter Johansson, MD
UK
Anthony Green, MD
Claire N. Harrison, MD
Deepti Radia, MD
Uruguay
Pablo Muxi, MD
USA
Alison Moliterno, MD
Brady Stein, MD MHS
Casey O'Connell
Catriona Jamieson
Daniel Rubin, ND
Elizabth Hexner
Hala Simm
Jason Gotlib, MD
Jeff Sloan, PhD
Jessica Altman, MD
Joseph Prchal, MD
Kimberly Hickman
Martin Tallman, MD
Mike Boxer, MD
Olatoyosi Odenike, MD
Richard T Silver, MD
Ross Levine, MD
Soo Jin Kim
Srdan Verstovsek, MD

Thanks to MPN Patients, and their loved ones, for Their Contributions to MPN Research

Courtesy of C. Harrison and UK MPN Patient