

Patient and physician characteristics associated with erythropoiesis-stimulating agent use in patients with myelodysplastic syndromes

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Online Supplementary Table S1. Characteristics of MDS patients - all, and all ESA users post MDS diagnosis.

Characteristics	All MDS	ESA Users (post MDS Diagnosis)
	%	%
N	6,588	4,112
Modified FAB group at diagnosis		
Lower risk	34.6	36.8
9980 - RA	16.6	17
9982 - RARS	11.8	13.3
9985 - RCMD	4.4	4.7
9986 - 5q deletion	1.8	1.8
Higher risk	13.7	14.6
9983 - RAEB	13.7	14.6
Risk not specified	51.7	48.6
9987 - Therapy-related MDS, NOS	1.4	1.2
9989 - MDS, NOS	50.4	47.4
Blood transfusion (12 months before MDS diagnosis)	23.3	24
Other primary cancer (within 5 years prior to MDS diagnosis)	10.3	10.8
Comorbid conditions (12 months prior to MDS diagnosis)		
Acute myocardial infarction (AMI)	2.9	2.6
Congestive heart failure (CHF) or ischemic heart disease (IHD)	44.6	44.2
Conduction disorder	28.9	27.6
Deep-vein thrombosis (DVT) and pulmonary embolism (PE)	3.3	2.9
Hepatitis or other liver diseases	4.3	3.8
Renal disease	7.4	6.7
Stroke	8.4	7.5
Dementia	8	5.5
Bipolar, major depression or schizophrenia	8.8	6.7
Indicators of Poor Performance Status (Healthcare use 12 months prior to MDS diagnosis)		
Hospital use	40.5	37.9
Oxygen and related supplies	6.4	5.5
SNF use	8.3	5.2
Walking aids	6.8	6.1
Wheelchair claims	6	4.3
Nursing home stay	8.9	4.8
Age at diagnosis		
<65	3.5	2.6
65-69	8.9	8.8
70-74	16.7	17.4
75-79	23.9	24.7
80-84	25.1	26.4
85+	22	20.1
Race/ethnicity		
White, non-Hispanic	88.5	89.8
Black, non-Hispanic	6.1	4.9
Hispanic	1.4	1.4
Other		4
Sex: Male	53.8	54.5
Marital Status		
Single, never married	6.8	5.6
Married	48.8	51.4
Divorced, separated, widowed, or unknown	44.4	43
Original Medicare entitlement due to disability or End Stage Renal Disease & > =65 years	7.9	7.1
Prior year Medicaid/Medicare Savings Programs	13.5	10.4
Median household income quartiles		
Lowest (<=\$35268.5)	24.9	23.4
Second (\$35268.6-\$46257.0)	25	24.2
Third (\$46257.1-\$61038.0)	24.9	25.5
Highest (>\$61038.0)	24.9	26.6

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Quartiles for percent of persons 25+ with <12 yrs education (race specific)		
Lowest (<=7.92)	24.7	27.1
Second (7.93-13.86)	24.7	25.2
Third (13.87-23.01)	24.6	23.7
Highest (>23.01)	24.7	22.5
> 5% households with difficulty speaking English		
No	79.6	80.4
Yes	20.1	19.3
Missing	0.3	0.3
Residence		
Large, small MSA	84	84.7
Urban, non MSA	5.6	5.6
Less urban, rural	10.4	9.7
Region		
Midwest	18.9	18.4
Northeast	21	19.8
South	17.7	17.9
West	42.3	43.9
Diagnosis year		
2001	17	16
2002	18	18
2003	21.1	21
2004	23.2	23.6
2005	20.7	21.4
Physicians' characteristics		
Speciality		
Heme-onc	83.9	89.4
Primary care	10.6	8
Other	2.7	1.7
Years from final medical school graduation year to diagnosis year of MDS		
< 10	6.1	5.9
10-19	27.8	29.5
20-29	37.4	37.6
30+	25.9	26.1
Type of practice		
Office based	84.7	86.8
Medical teaching or research	4.5	4.2
Residency/fellowship or hospital based	5.7	5.6
Other or inactive	2.3	2.5

ESA: erythropoiesis stimulating agents; MDS: myelodysplastic syndromes; FAB: French-American-British; RA: refractory anemia; RARS: refractory anemia with ringed sideroblasts; RAEB: refractory anemia with excess blasts; RCMD: refractory cytopenia with multilineage dysplasia; NOS: not otherwise specified; SNF: skilled nursing facility; MSA: metropolitan statistical area. Source: Surveillance, Epidemiology and End Results (SEER)-Medicare, 2001-2005; linked American Medical Association data on physicians' characteristics.

Online Supplementary Table S2. Determinants of ESA Use by MDS Risk Groups.

Characteristics	Receipt of Any ESA Pre or Post MDS Dxdt among MDS Lower Risk Group (N=2162)				Receipt of Any ESA Pre or Post MDS Dxdt among MDS Higher Risk Group (N=869)				Receipt of Any ESA Pre or Post MDS Dxdt among MDS Risk Not Specified Group (N=3200)			
	OR	95% Confidence Interval		P value	OR	95% Confidence Interval		P value	OR	95% Confidence Interval		P value
	Modified FAB group at diagnosis*											
9980 - RA	Ref	Ref	Ref	Ref	N/A				N/A			
9982 - RARS	1.36	1.09	1.71	0.01								
9985 - RCMD	1.10	0.80	1.51	0.55								
9986 - 5q deletion	0.85	0.54	1.32	0.46								
Blood transfusion (12 months before MDS dxdt)	1.89	1.44	2.48	<0.0001	1.76	1.13	2.76	0.01	1.85	1.50	2.27	<0.0001
Other primary cancer (within 5 years prior to MDS dxdt)	1.37	0.97	1.94	0.07	1.01	0.62	1.63	0.98	1.03	0.79	1.35	0.81
History of comorbidities												
Acute myocardial infarction (AMI)	1.09	0.56	2.12	0.80	0.86	0.31	2.41	0.77	0.80	0.52	1.22	0.30
Congestive heart failure (CHF) or ischemic heart disease (IHD)	1.14	0.91	1.42	0.25	0.92	0.64	1.32	0.64	1.08	0.91	1.29	0.36
Conduction disorder	0.92	0.72	1.17	0.49	1.12	0.75	1.67	0.59	0.92	0.76	1.10	0.35
Deep-vein thrombosis (DVT) and pulmonary embolism (PE)	1.24	0.71	2.17	0.45	0.69	0.27	1.79	0.45	0.79	0.51	1.22	0.29
Hepatitis or other liver diseases	0.81	0.50	1.31	0.38	1.10	0.51	2.38	0.81	0.76	0.53	1.10	0.14
Renal disease	0.95	0.65	1.39	0.80	1.14	0.58	2.23	0.71	1.03	0.76	1.39	0.85
Stroke	0.80	0.56	1.15	0.23	1.06	0.56	1.98	0.87	0.96	0.72	1.26	0.74
Alzheimer disease	0.67	0.45	1.00	0.05	0.70	0.34	1.45	0.34	0.62	0.46	0.82	0.00
Bipolar or depression or schizophrenia	1.00	0.69	1.45	0.99	0.89	0.51	1.58	0.70	0.76	0.58	1.01	0.06
Healthcare use - prior 12 months												
Hospital use	0.87	0.68	1.12	0.28	0.73	0.49	1.10	0.13	0.97	0.80	1.18	0.76
Oxygen and related supplies	0.78	0.51	1.20	0.26	0.57	0.28	1.14	0.11	0.87	0.64	1.18	0.36
SNF use	1.15	0.64	2.06	0.64	0.58	0.22	1.54	0.28	1.06	0.68	1.65	0.79
Walking aids	1.23	0.81	1.87	0.34	1.04	0.53	2.01	0.92	1.05	0.77	1.43	0.76
Wheelchair claims	0.68	0.44	1.04	0.07	1.04	0.47	2.31	0.92	0.63	0.46	0.86	0.00
Nursing home stay	0.29	0.17	0.51	<0.0001	0.43	0.17	1.08	0.07	0.37	0.25	0.57	<0.0001
Age at diagnosis#												
<65	0.52	0.27	1.00	0.05	2.24	0.80	6.32	0.13	0.58	0.36	0.95	0.03
65-69	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
70-74	0.78	0.52	1.18	0.24	2.00	1.12	3.59	0.02	1.27	0.91	1.80	0.17
75-79	0.90	0.61	1.34	0.60	1.64	0.93	2.88	0.09	1.10	0.80	1.52	0.56
80-84	1.00	0.67	1.49	0.99	1.96	1.11	3.49	0.02	1.26	0.91	1.74	0.17
85+	1.05	0.69	1.60	0.82	1.47	0.81	2.66	0.21	0.80	0.58	1.12	0.19
Race/ethnicity#												
White, non-Hispanic	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Black, non-Hispanic	0.83	0.55	1.27	0.39	1.13	0.52	2.44	0.76	0.66	0.47	0.92	0.01
Hispanic	1.03	0.41	2.61	0.95	0.36	0.07	1.85	0.22	1.88	0.95	3.73	0.07
Other	1.24	0.72	2.13	0.44	0.99	0.42	2.30	0.97	1.05	0.69	1.60	0.81
Sex												
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	1.30	1.05	1.61	0.02	1.07	0.76	1.51	0.69	0.90	0.76	1.07	0.24
Marital Status												
Single, never married	0.82	0.54	1.23	0.33	0.69	0.35	1.36	0.29	0.76	0.55	1.03	0.08
Married	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Divorced, separated, widowed, or unknown	0.93	0.74	1.17	0.55	0.73	0.51	1.04	0.08	1.09	0.92	1.31	0.32
Disabled or ESRD for original Medicare entitlement & > =65 years at MDS dxdt	0.99	0.68	1.45	0.97	1.16	0.61	2.19	0.65	0.80	0.61	1.07	0.13
Prior year Medicaid/MSPs												
No Medicaid	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Medicaid	0.54	0.39	0.76	0.00	0.88	0.48	1.62	0.68	0.71	0.56	0.90	0.00
Median household income quartiles												
Lowest (<=\$35268.5)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Second (\$35268.6-\$46257.0)	1.11	0.82	1.52	0.50	1.32	0.83	2.11	0.25	0.81	0.64	1.03	0.09
Third (\$46257.1-\$61038.0)	1.31	0.93	1.85	0.12	1.67	0.96	2.89	0.07	0.86	0.65	1.14	0.29
Highest (>\$61038.0)	1.26	0.85	1.86	0.26	1.96	1.04	3.68	0.04	0.83	0.60	1.14	0.24

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Quartiles for percent of persons 25+ with
<12 yrs education (race specific)#

Lowest (<=7.92)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Second (7.93-13.86)	0.99	0.73	1.33	0.94	1.04	0.64	1.70	0.88	0.71	0.56	0.91	0.01
Third (13.87-23.01)	0.93	0.66	1.30	0.66	0.88	0.51	1.53	0.65	0.74	0.56	0.98	0.03
Highest (>23.01)	1.06	0.71	1.58	0.79	0.81	0.43	1.54	0.52	0.58	0.42	0.81	0.00

> 5% households with difficulty speaking English

No	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Yes	1.01	0.75	1.37	0.95	1.08	0.68	1.69	0.75	1.11	0.88	1.41	0.38

Residence

Large, small MSA	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Urban, non MSA	0.77	0.48	1.23	0.27	1.07	0.56	2.06	0.83	1.10	0.77	1.55	0.60
Less urban, rural	1.18	0.80	1.73	0.41	0.70	0.40	1.23	0.21	0.80	0.60	1.07	0.14

Region*

Midwest	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Northeast	0.76	0.55	1.07	0.11	1.12	0.64	1.96	0.70	0.99	0.77	1.27	0.92
South	1.41	1.02	1.97	0.04	1.07	0.63	1.82	0.80	1.31	1.00	1.72	0.05
West	1.47	1.10	1.97	0.01	0.85	0.54	1.35	0.50	1.23	0.96	1.57	0.10

Diagnosis year

2001	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
2002	1.09	0.78	1.52	0.63	0.81	0.47	1.40	0.45	1.05	0.81	1.35	0.73
2003	1.21	0.88	1.68	0.24	0.71	0.42	1.19	0.19	1.09	0.85	1.39	0.51
2004	1.24	0.90	1.70	0.19	1.04	0.61	1.75	0.90	1.11	0.87	1.42	0.39
2005	1.35	0.97	1.88	0.08	0.77	0.46	1.28	0.31	1.17	0.91	1.51	0.21

Physicians' characteristics

Speciality* & #

Heme-onc	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Primary care	0.45	0.32	0.61	<0.0001	0.68	0.39	1.21	0.19	0.47	0.37	0.59	<0.0001
Other	0.20	0.11	0.36	<0.0001	0.17	0.06	0.46	0.00	0.35	0.22	0.54	<0.0001

Years from final medical school graduation

year to diagnosis year of MDS*

< 10	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
10-19	1.20	0.78	1.87	0.41	1.73	0.87	3.42	0.12	1.37	0.98	1.93	0.07
20-29	0.96	0.62	1.47	0.84	1.64	0.84	3.19	0.15	1.22	0.87	1.70	0.24
30+	0.81	0.52	1.26	0.35	1.84	0.91	3.71	0.09	1.19	0.84	1.68	0.33

Type of practice#

Office based	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Medical teaching or research	0.91	0.58	1.43	0.67	0.58	0.30	1.11	0.10	0.61	0.42	0.87	0.01
Residency/fellowship or hospital based	0.65	0.43	0.98	0.04	1.66	0.79	3.49	0.18	0.86	0.62	1.18	0.34
Other or inactive	1.35	0.66	2.73	0.41	1.63	0.64	4.20	0.31	1.43	0.83	2.44	0.20

Model Fit Statistics

R-Square	0.11				0.1				0.1			
Max-rescaled R-Square	0.15				0.1				0.2			
Likelihood Ratio Test	χ^2	DF	P value		χ^2	DF	P value		χ^2	DF	P value	
	243	57	<0.0001		97	54	0		396	54	<0.0001	

ESA: erythropoiesis stimulating agents; MDS: myelodysplastic syndromes; Dxdt: diagnosis date; FAB: French-American-British; RA: refractory anemia; RARS: refractory anemia with ringed sideroblasts; RAEB: refractory anemia with excess blasts; RCMD: refractory cytopenia with multilineage dysplasia; SNF: skilled nursing facility; MSPs: Medicare Savings Programs; MSA: metropolitan statistical area. Note: *, &, # means a categorical variable with three or over categories is jointly significant at P<0.05 in the models of Receipt of Any ESA Pre or Post MDS Dxdt by MDS Lower Risk Group, MDS Higher Risk Group, and MDS Risk Not Specified Group, respectively.

Online Supplementary Table S3. Determinants of Receipt of Therapeutic Length ESA Episode among ESA Users from MDS Dxdt by MDS Risk Group.

Characteristics	Receipt of Therapeutic Length ESA Episode among All ESA Users from MDS Dxdt-MDS Lower Risk Group (N=1468)				Receipt of Therapeutic Length ESA Episode among All ESA Users from MDS Dxdt-MDS Higher Risk Group (N=586)				Receipt of Therapeutic Length ESA Episode among All ESA Users from MDS Dxdt-MDS Risk Not Specified Group (N=1905)			
	OR	95% Confidence Interval	P value		OR	95% Confidence Interval	P value		OR	95% Confidence Interval	P value	
Modified FAB group at diagnosis*												
9980 - RA	Ref	Ref	Ref	Ref								
9982 - RARS	1.54	1.15	2.07	0.00								
9985 - RCMD	1.02	0.68	1.54	0.91								
9986 - 5q deletion	1.22	0.65	2.30	0.53								
Blood transfusion (12 months before MDS dxdt)	1.37	0.98	1.92	0.07	0.88	0.52	1.48	0.62	1.19	0.92	1.55	0.19
Other primary cancer (within 5 years prior to MDS dxdt)	1.16	0.75	1.79	0.51	0.76	0.43	1.35	0.35	0.85	0.60	1.20	0.36
History of comorbidities												
Acute myocardial infarction (AMI)	1.80	0.70	4.63	0.22	0.33	0.08	1.29	0.11	1.07	0.58	2.00	0.83
Congestive heart failure (CHF) or ischemic heart disease (IHD)	0.90	0.68	1.20	0.48	0.73	0.47	1.13	0.16	1.06	0.84	1.33	0.64
Conduction disorder	0.84	0.62	1.14	0.25	0.81	0.50	1.31	0.38	1.06	0.83	1.37	0.64
Deep-vein thrombosis (DVT) and pulmonary embolism (PE)	0.82	0.41	1.67	0.59	0.41	0.12	1.43	0.16	1.22	0.62	2.41	0.56
Hepatitis or other liver diseases	0.76	0.39	1.47	0.41	1.64	0.57	4.69	0.36	0.95	0.58	1.56	0.84
Renal disease	1.53	0.88	2.66	0.13	1.28	0.52	3.17	0.59	0.85	0.57	1.27	0.43
Stroke	0.98	0.60	1.59	0.92	1.37	0.60	3.12	0.46	0.80	0.55	1.16	0.23
Alzheimer disease	0.82	0.47	1.43	0.48	0.15	0.05	0.48	0.00	0.70	0.46	1.08	0.11
Bipolar or depression or schizophrenia	0.76	0.46	1.23	0.26	0.69	0.32	1.49	0.35	0.76	0.50	1.16	0.20
Healthcare use - prior 12 months												
Hospital use	0.71	0.52	0.98	0.04	1.24	0.74	2.08	0.42	0.74	0.58	0.96	0.02
Oxygen and related supplies	1.17	0.65	2.13	0.60	1.60	0.57	4.49	0.37	0.84	0.55	1.29	0.43
SNF use	0.40	0.18	0.90	0.03	1.35	0.27	6.72	0.72	1.03	0.49	2.16	0.95
Walking aids	1.13	0.65	1.96	0.66	0.47	0.20	1.11	0.09	0.90	0.59	1.38	0.62
Wheelchair claims	0.76	0.42	1.38	0.37	1.14	0.38	3.44	0.81	0.47	0.29	0.77	0.00
Nursing home stay	1.41	0.60	3.32	0.44	0.52	0.11	2.36	0.40	1.14	0.54	2.41	0.74
Age at diagnosis												
<65	0.79	0.30	2.08	0.64	0.31	0.09	1.15	0.08	0.55	0.27	1.12	0.10
65-69	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
70-74	1.05	0.62	1.79	0.86	0.83	0.38	1.83	0.65	0.96	0.61	1.51	0.84
75-79	1.07	0.64	1.77	0.81	0.62	0.29	1.33	0.22	1.20	0.77	1.87	0.42
80-84	1.09	0.66	1.82	0.73	0.85	0.39	1.87	0.69	1.05	0.68	1.63	0.82
85+	0.93	0.55	1.56	0.78	0.46	0.21	1.04	0.06	0.88	0.56	1.39	0.58
Race/ethnicity												
White, non-Hispanic	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Black, non-Hispanic	0.96	0.53	1.76	0.90	1.53	0.56	4.20	0.41	1.00	0.61	1.64	1.00
Hispanic	0.70	0.23	2.09	0.52	1.15	0.09	15.70	0.91	0.54	0.25	1.18	0.12
Other	0.95	0.48	1.86	0.87	0.86	0.29	2.55	0.79	0.83	0.48	1.44	0.51
Sex												
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	1.08	0.82	1.44	0.58	1.19	0.78	1.84	0.42	0.95	0.76	1.19	0.67
Marital Status [†]												
Single, never married	0.79	0.45	1.39	0.41	0.47	0.18	1.17	0.10	2.23	1.32	3.77	0.00
Married	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Divorced, separated, widowed, or unknown	0.83	0.62	1.11	0.21	1.01	0.65	1.58	0.97	1.16	0.92	1.47	0.21
Disabled or ESRD for original Medicare entitlement & >=65 years at MDS dxdt	0.96	0.58	1.59	0.89	0.38	0.18	0.82	0.01	0.96	0.65	1.43	0.85
Prior year Medicaid/MSPs												
No Medicaid	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Medicaid	0.81	0.51	1.29	0.38	0.49	0.21	1.12	0.09	0.65	0.46	0.91	0.01
Median household income quartiles [‡]												
Lowest (<=\$35268.5)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Second (\$35268.6-\$46257.0)	1.13	0.74	1.72	0.58	1.91	1.01	3.60	0.05	0.85	0.61	1.17	0.31
Third (\$46257.1-\$61038.0)	1.03	0.65	1.64	0.89	1.71	0.84	3.47	0.14	1.09	0.75	1.58	0.65
Highest (>\$61038.0)	0.92	0.55	1.53	0.74	2.91	1.31	6.49	0.01	0.98	0.64	1.49	0.92

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Quartiles for percent of persons

25+ with <12 yrs education (race specific)

Lowest (<=7.92)	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Second (7.93-13.86)	0.90	0.62	1.31	0.57	1.12	0.64	1.97	0.70	0.92	0.66	1.27	0.60
Third (13.87-23.01)	0.83	0.54	1.29	0.41	1.98	1.00	3.93	0.05	0.89	0.62	1.28	0.52
Highest (>23.01)	0.64	0.38	1.08	0.10	1.61	0.71	3.63	0.25	0.76	0.50	1.17	0.21

> 5% households with difficulty speaking English

No	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Yes	1.25	0.84	1.86	0.27	1.68	0.94	3.02	0.08	0.91	0.67	1.25	0.57

Residence

Large, small MSA	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Urban, non MSA	1.65	0.80	3.43	0.18	0.85	0.38	1.90	0.69	1.11	0.70	1.74	0.66
Less urban, rural	1.75	1.02	3.02	0.04	1.06	0.48	2.32	0.89	1.07	0.71	1.61	0.75

Region* #

Midwest	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Northeast	1.04	0.66	1.62	0.88	0.72	0.38	1.37	0.31	0.68	0.48	0.96	0.03
South	2.12	1.35	3.35	0.00	0.89	0.46	1.72	0.74	0.96	0.66	1.39	0.83
West	1.34	0.93	1.94	0.12	1.29	0.73	2.27	0.38	1.17	0.83	1.66	0.37

Diagnosis year

2001	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
2002	1.97	1.24	3.15	0.00	0.96	0.49	1.88	0.90	1.12	0.79	1.59	0.53
2003	1.17	0.77	1.78	0.45	1.30	0.68	2.47	0.43	1.13	0.81	1.58	0.49
2004	1.30	0.86	1.96	0.22	1.73	0.92	3.26	0.09	1.19	0.85	1.66	0.31
2005	1.29	0.84	1.97	0.25	1.47	0.79	2.76	0.23	1.15	0.82	1.61	0.43

Physicians' characteristics

Speciality

Heme-onc	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Primary care	0.81	0.50	1.33	0.41	1.49	0.67	3.34	0.33	0.84	0.58	1.21	0.35
Other	0.60	0.23	1.59	0.31	0.42	0.09	2.10	0.29	0.78	0.38	1.61	0.50

Years from final medical school

graduation year to diagnosis year of MDS

< 10	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
10-19	0.91	0.51	1.62	0.75	1.91	0.78	4.68	0.16	1.26	0.78	2.04	0.34
20-29	1.06	0.60	1.88	0.84	2.04	0.85	4.89	0.11	0.97	0.61	1.56	0.90
30+	1.12	0.62	2.02	0.72	1.70	0.69	4.21	0.25	0.86	0.53	1.41	0.55

Type of practice

Office based	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Medical teaching or research	0.77	0.43	1.38	0.38	0.66	0.28	1.54	0.34	1.19	0.67	2.13	0.56
Residency/fellowship or hospital based	1.32	0.68	2.55	0.41	0.69	0.31	1.50	0.35	1.04	0.68	1.60	0.85
Other or inactive	0.68	0.29	1.59	0.37	1.20	0.40	3.56	0.75	1.51	0.74	3.07	0.26

Model Fit Statistics

R-Square	0.06			0.1			0.0505		
Max-rescaled R-Square	0.09			0.2			0.0720		
Likelihood Ratio Test	χ^2	DF	P value	χ^2	DF	P value	χ^2	DF	P value
	90.4	57	0.003	86	54	0.004	98.648	54	0.0002

ESA: erythropoiesis stimulating agents; MDS: myelodysplastic syndromes; Dxdt: diagnosis date; FAB: French-American-British; RA: refractory anemia; RARS: refractory anemia with ringed sideroblasts; RAEB: refractory anemia with excess blasts; RCMD: refractory cytopenia with multilineage dysplasia; SNF: skilled nursing facility; MSPs: Medicare Savings Programs; MSA: metropolitan statistical area. Note: *, &, # means a categorical variable with three or over categories is jointly significant at P<0.05 in the models of Receipt of Therapeutic Length ESA Episode among All ESA Users from MDS Dxdt by MDS Lower Risk Group, MDS Higher Risk Group, and MDS Risk Not Specified Group, respectively.