

Practice Patterns of Perioperative Management of Antiplatelet and Anticoagulant Therapy In Interventional Pain Management





Participants

Total 132 responses with 110 submitted as Individual provider and 22 submitted as group for 75 providers.

Number procedures performed by
region per year

Region	N	Range	Total	Mean \pm SD
Cervical	158	2 – 2500	66,344	420 \pm 435
Thoracic	157	3 – 5000	24,025	834 \pm 771
Lumbar	154	1 -2000	131,536	156 \pm 235

Practice Setting

	Frequency	Percent
ASC	6	3.2
Hospital	20	10.8
Office	48	25.9
Office, ASC	77	41.6
Office, Hospital	11	5.9
All	23	12.4
Total	185	

77% providers not changed practice pattern on Antithrombotic?

Procedures by Risk Category

Low-Risk Procedures	Intermediate-Risk Procedures	High-Risk Procedures
Trigger point and muscular injections (including piriformis injection)	Facet joint interventions (intra-articular injections, NB and RFTN)	Cervical, thoracic, and lumbar interlaminar epidurals
Peripheral joints	Lumbar transforaminal epidural injections at L4, L5, S1	Cervical, thoracic and lumbar above L3 transforaminal epidural injections
Peripheral nerve blocks	Lumbar intradiscal procedures/	Spinal cord stimulator trial and implant
Sacroiliac joint and ligament injections and nerve blocks	Hypogastric plexus blocks	Percutaneous adhesiolysis with interlaminar or transforaminal approach
Caudal epidural injections	Lumbar sympathetic blocks	Percutaneous disc decompression (above L4/5)
Ganglion impar blocks	Peripheral nerve stimulation trial and implant	Sympathetic blocks (stellate ganglion; thoracic splanchnic, celiac plexus)
	Pocket revision and implantable pulse regenerator/ intrathecal pump repl.	Thoracic and cervical intradiscal procedures
	Caudal percutaneous adhesiolysis	Vertebral augmentation, lumbar (above L4), thoracic and cervical
	Lumbar percutaneous disc decompression (L4/5 or below)	Intrathecal catheter and pump implant
	Lumbar vertebral augmentation (below L4)	Interspinous prosthesis and MILD®

*Patients with high risk of bleeding (e.g., old age, history of bleeding tendency, concurrent uses of other anticoagulants/antiplatelets, liver cirrhosis or advanced liver disease, and advanced renal disease) undergoing low or intermediate-risk procedures should be treated as intermediate or high risk, respectively

Practice pattern on Antithrombotic/Antiplatelets

	Low Risk Procedures					Intermediate-Risk Procedures					High Risk Procedures				
	No Response	None	3 days	5 days	>=7 days	No Response	None	3 days	5 days	>=7 days	No Response	None	3 days	5 days	>=7 days
NSAIDs: (COX 1) or (COX 2)	27	87% (138)	7% (11)	5% (8)	1% (1)	45	61% (85)	22% (31)	10% (14)	7% (10)	22	36% (59)	12% (20)	36% (59)	15% (25)
THC/CBD	30	98% (151)	1% (2)	1% (2)	-	47	90% (124)	4% (5)	3% (4)	4% (5)	23	80% (129)	2% (4)	5% (8)	13% (21)
Aspirin															
Low-Dose Aspirin	2	92% (169)	2% (3)	5% (9)	1% (2)	20	66% (109)	13% (21)	8% (14)	13% (21)	20	24% (40)	6% (6)	38% (63)	32% (53)
High Dose Aspirin	8	86% (152)	5% (8)	3% (6)	6% (11)	22	50% (82)	9% (14)	17% (28)	24% (39)	22	10% (16)	7% (12)	37% (61)	46% (74)
Antiplatelet Agents															
Dipyridamole (Persantine)	50	82% (111)	7% (9)	5% (7)	6% (8)	66	40% (48)	25% (30)	16% (19)	19% (22)	38	7% (10)	48% (70)	16% (23)	30% (44)
Cilostazol (Pletal)	50	82% (110)	7% (10)	5% (7)	6% (8)	69	41% (47)	22% (26)	17% (20)	20% (23)	35	5% (7)	51% (77)	15% (23)	29% (43)
Aggrenox	49	77% (105)	9% (12)	6% (8)	8% (11)	64	37% (45)	17% (21)	17% (21)	28% (34)	38	5% (8)	13% (19)	44% (65)	38% (55)
Platelet Aggregation Inhibitors															
Clopidogrel (Plavix)	10	59% (104)	3% (5)	22% (38)	16% (28)	27	10% (15)	2% (4)	33% (52)	55% (87)	35	1% (1)	1% (2)	17% (26)	81% (121)
Prasugrel (Effient)	48	69% (94)	6% (8)	9% (12)	17% (23)	33	11% (17)	6% (9)	19% (29)	64% (97)	39	1% (1)	10% (15)	16% (23)	73% (107)
Ticlopidine (Ticlid)	22	74% (121)	4% (6)	12% (19)	10% (17)	63	12% (15)	7% (8)	35% (43)	46% (56)	69	3% (3)	7% (8)	34% (39)	57% (66)
Ticagrelor (Brilinta)	47	71% (98)	5% (7)	13% (18)	11% (15)	38	10% (15)	8% (12)	57% (84)	25% (36)	31	1% (1)	8% (13)	54% (83)	37% (57)

Continued ...

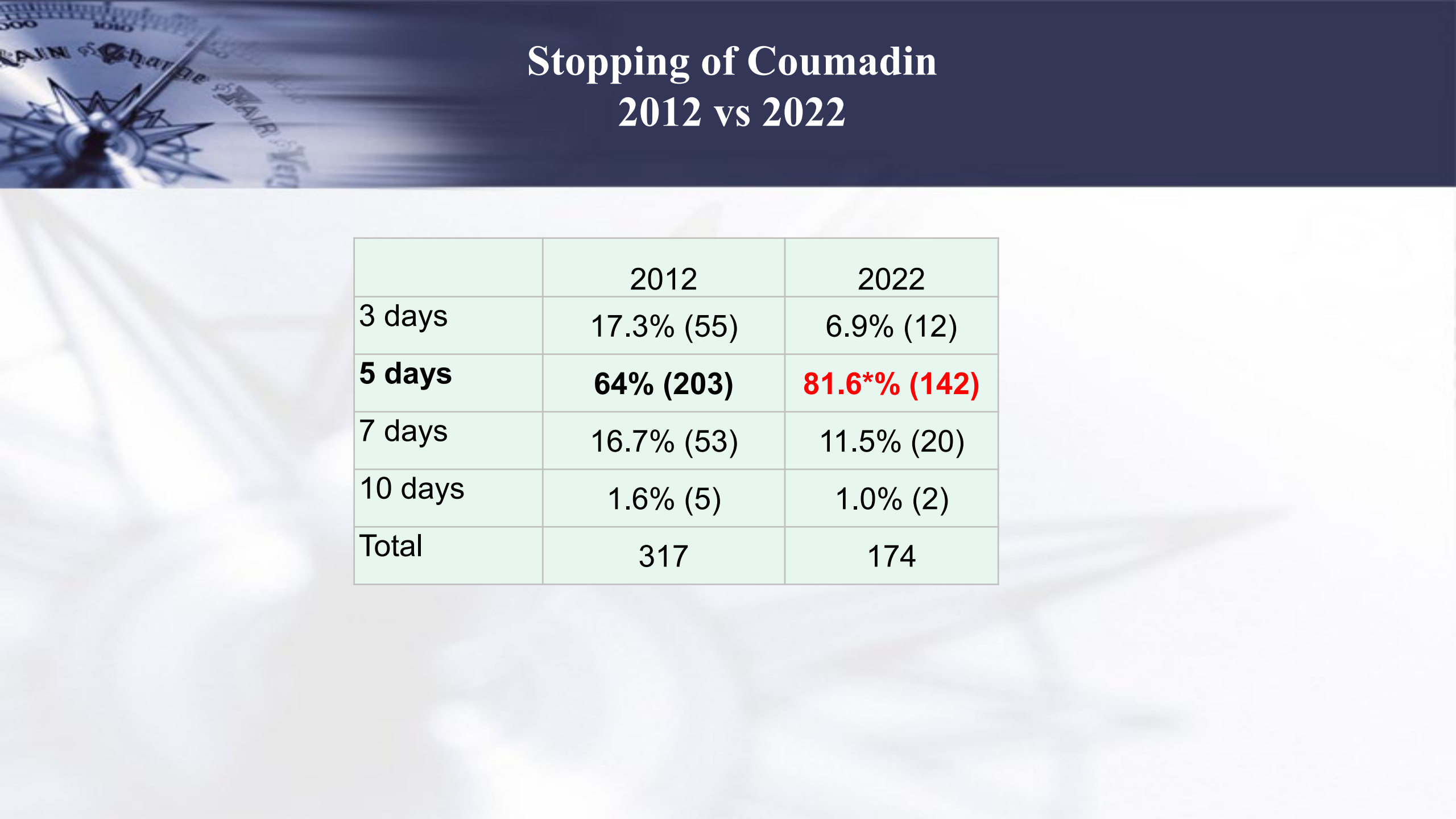
Practice pattern on Antithrombotic/Antiplatelets

	Low Risk Procedures*					Intermediate-Risk Procedures*					High Risk Procedures*				
	No Response	None	3 days	5 days	>=7 days	No Response	None	3 days	5 days	>=7 days	No Response	None	3 days	5 days	>=7 days
Thrombin Inhibitors															
Dabigatran (Pradaxa)	44	67% (94)	11% (16)	14% (19)	8% (12)	37	8% (12)	17% (25)	60% (89)	15% (22)	42	1% (1)	22% (31)	55% (79)	22% (32)
Anti-Xa Agents															
Apixaban (Eliquis)	3	72% (130)	23% (42)	3% (6)	2% (4)	26	9% (15)	72% (115)	15% (23)	4% (6)	26	1% (1)	79% (125)	12% (19)	9% (14)
Rivaroxaban (Xarelto)	3	72% (131)	23% (42)	3% (6)	2% (3)	26	9% (15)	73% (116)	13% (21)	4% (7)	26	1% (1)	77% (122)	13% (21)	9% (15)
Edoxaban (Savaysa, Lixiana)	7	77% (137)	18% (32)	3% (6)	2% (3)	42	11% (15)	69% (99)	16% (23)	4% (6)	44	1% (2)	75% (106)	14% (19)	10% (14)
GPIIb/IIIa Inhibitors															
Abciximab (ReoPro)	38	76% (112)	9% (13)	10% (15)	5% (7)	83	18% (18)	37% (38)	32% (33)	13% (13)	88	5% (5)	26% (25)	48% (47)	21% (20)
Eptifibatide (Integrilin)	37	76% (113)	13% (19)	6% (9)	5% (7)	86	20% (20)	46% (45)	21% (21)	13% (13)	91	10% (9)	46% (43)	23% (22)	21% (20)
Tirofiban (Aggrastat)	37	76% (113)	13% (19)	6% (9)	5% (7)	86	20% (20)	45% (44)	22% (22)	13% (13)	92	10% (9)	46% (43)	23% (21)	21% (20)
Miscellaneous															
Fondaparinux (Arixtra)	11	81% (141)	6% (11)	10% (18)	2% (4)	63	13% (16)	19% (23)	61% (74)	7% (9)	61	4% (5)	15% (19)	65% (81)	15% (19)



Stopping of Coumadin?

	Number	Percent
3 days	12	6.5
5 days	142	76.8
7 days	20	10.8
10 days	2	1.1
No response	11	60
Total	185	100.0



Stopping of Coumadin 2012 vs 2022

	2012	2022
3 days	17.3% (55)	6.9% (12)
5 days	64% (203)	81.6*% (142)
7 days	16.7% (53)	11.5% (20)
10 days	1.6% (5)	1.0% (2)
Total	317	174

Procedures by Risk Category

Low-Risk Procedures	Intermediate-Risk Procedures	High-Risk Procedures
Trigger point and muscular injections (including piriformis injection)	Facet joint interventions (intra-articular injections, NB and RFTN)	Cervical, thoracic, and lumbar interlaminar epidurals
Peripheral joints	Lumbar transforaminal epidural injections at L4, L5, S1	Cervical, thoracic and lumbar above L3 transforaminal epidural injections
Peripheral nerve blocks	Lumbar intradiscal procedures/	Spinal cord stimulator trial and implant
Sacroiliac joint and ligament injections and nerve blocks	Hypogastric plexus blocks	Percutaneous adhesiolysis with interlaminar or transforaminal approach
Caudal epidural injections	Lumbar sympathetic blocks	Percutaneous disc decompression (above L4/5)
Ganglion impar blocks	Peripheral nerve stimulation trial and implant	Sympathetic blocks (stellate ganglion; thoracic splanchnic, celiac plexus)
	Pocket revision and implantable pulse regenerator/ intrathecal pump repl.	Thoracic and cervical intradiscal procedures
	Caudal percutaneous adhesiolysis	Vertebral augmentation, lumbar (above L4), thoracic and cervical
	Lumbar percutaneous disc decompression (L4/5 or below)	Intrathecal catheter and pump implant
	Lumbar vertebral augmentation (below L4)	Interspinous prosthesis and MILD®

*Patients with high risk of bleeding (e.g., old age, history of bleeding tendency, concurrent uses of other anticoagulants/antiplatelets, liver cirrhosis or advanced liver disease, and advanced renal disease) undergoing low or intermediate-risk procedures should be treated as intermediate or high risk, respectively

INR Limit ranges by procedure

Low-Risk Procedures

	Do not perform the procedure	Do not check	≤ 1.50	1.51- 2.0	> 2.0	Total
Trigger point and muscular injections (including piriformis injection)	48	29% (40)	17% (23)	16% (22)	38% (52)	137
Peripheral joints	51	25% (34)	16% (22)	13% (18)	45% (60)	134
Peripheral nerve blocks	51	22% (30)	20% (27)	14% (19)	43% (58)	134
Sacroiliac joint and ligament injections and nerve blocks	47	25% (34)	28% (38)	12% (16)	36% (50)	138
Caudal epidural injections	41	8% (12)	68% (98)	13% (19)	10% (15)	144
Ganglion impar blocks	79	18% (19)	44% (47)	23% (24)	15% (16)	106

INR Limit ranges by procedure

Intermediate-Risk Procedures

	Do not perform the procedure	Do not check	<=1.50	1.51-2.0	> 2.0	Total
Facet joint interventions (intra-articular injections, NB and RFTN)	45	11% (15)	46% (65)	11% (16)	31% (44)	140
Lumbar transforaminal epidural injections at L4, L5, S1	38		82% (121)	14% (21)	3% (5)	147
Lumbar intradiscal procedures/	51		87% (117)	12% (13)	1% (4)	134
Hypogastric plexus blocks	53		92% (122)	7% (9)	2% (2)	133
Lumbar sympathetic blocks	43		92% (130)	7% (10)	1% (2)	142
Peripheral nerve stimulation trial and implant	71		83% (95)	12% (14)	4% (5)	114
Pocket revision and implantable pulse regenerator/ intrathecal pump repl.	90		84% (80)	12% (11)	4% (4)	95
Caudal percutaneous adhesiolysis	102		89% (74)	8% (7)	2% (2)	83
Lumbar percutaneous disc decompression (L4/5 or below)	104		86% (70)	12% (10)	1% (1)	81
Lumbar vertebral augmentation (below L4)	56		90% (116)	9% (12)	1% (1)	129

INR Limit ranges by procedure

High-Risk Procedures

	Do not perform the procedure	≤1.50	1.51-2.0	> 2.0	Total
Cervical, thoracic, and lumbar interlaminar epidurals	26	94% (150)	4% (7)	1% (2)	159
Cervical, thoracic and lumbar above L3 transforaminal epidural injections	35	95% (143)	4% (6)	1% (1)	150
Spinal cord stimulator trial and implant	23	95% (154)	4% (7)	1% (1)	162
Percutaneous adhesiolysis with interlaminar or transforaminal approach	89	95% (92)	4% (4)	1% (1)	97
Percutaneous disc decompression (above L4/5)	81	94% (98)	5% (5)	1% (1)	104
Sympathetic blocks (stellate ganglion, thoracic splanchnic, celiac plexus)	36	95% (142)	4% (6)	1% (1)	149
Thoracic and cervical intradiscal procedures	72	96% (109)	4% (4)	0% (0)	113
Vertebral augmentation, lumbar (above L4), thoracic and cervical	50	95% (128)	4% (6)	1% (1)	135
Intrathecal catheter and pump implant	84	97% (98)	3% (3)	0% (0)	101
Interspinous prosthesis and MILD®	88	95% (92)	5% (5)	0% (0)	97

15% (28) of providers seen complications in their patients **WHEN CONTINUED.**

	No	If yes, Number of providers with positive by drug class									
		Aspirin	NSAIDS	Antiplatelet Agents	Platelet Aggregation Inhibitors	Vitamin K Antagonists	Thrombin Inhibitors	Anti-Xa Agents	Thrombolytic Agents	GPIIb/IIIa Inhibitors	Miscellaneous
Excessive bleeding with no adverse consequences	114	13	7	10	7	6	7	6	6	4	0
Coronary artery infarct or event	130	1	1	2							
Cerebral infarct or event	131			1							
Peripheral vascular infarct -Other	131				1						
Epidural hematoma	126	2	1	1	2	1					1
<u>Requiring</u> only monitoring	126	1		2	2	1	1	0	1	0	1
<i>Without</i> surgical intervention <u>With</u> significant neurological dysfunction	129	1	1								1
<u>With</u> surgical intervention <i>Without</i> neurological dysfunction	124	1	1	1	3			1			
<u>With</u> surgical interventional or/and <u>With</u> significant neurological dysfunction	129	1			1			1			

19% (36) of providers seen complications in their patients **WHEN DISCONTINUED.**

	No	If yes, Number of Cases (+) by drug class									
		Aspirin	NSAIDS	Antiplatelet Agents	Platelet Aggregation Inhibitors	Vitamin K Antagonists	Thrombin Inhibitors	Anti-Xa Agents	Thrombolytic Agents	GPIIb/IIIa Inhibitors	Miscellaneous
Excessive bleeding with no adverse consequences	127	3	2	1	2	1	1	1	1	2	1
Coronary artery infarct or event	118	1	1	4	2	1	1	2	2		
Cerebral infarct or event	117	2		4	3	3	2	3	1		
Peripheral vascular infarct -Other	127			3	3	1	2	2	1		
Epidural hematoma	130	1									
<u>Requiring</u> only monitoring	130				2						
<i>Without</i> surgical intervention <u>With</u> significant neurological dysfunction	130		1		1						
<u>With</u> surgical intervention <i>Without</i> neurological dysfunction	128	2		1	1						
<u>With</u> surgical interventional or/and <u>With</u> significant neurological dysfunction	131				1						