## Practice Pattern Trends Among Pediatric Orthopaedic Surgeons for the Treatment of Femoral Shaft Fractures

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The treatment of diaphyseal femur fractures is influenced by the age and weight of the child, location and pattern of fracture, and surgeon and family preferences. Although these injuries are common, the AAOS Clinical Practice Guidelines (CPGs) are limited by the quality and quantity of evidence in the literature. The purpose of this study is to assess current practice patterns in the treatment of femoral shaft fractures among pediatric orthopaedic surgeons.

## METHODS:

The Pediatric Orthopaedic Association of North America (POSNA) Trauma Quality, Safety, and Value Initiative Committee distributed a 12-question survey concerning the treatment of pediatric femoral shaft fractures to all active POSNA members practicing in North America. Two-hundred and twenty-six eligible responses were collected and assessed in relation to CPGs and for trends based on surgeon age, practice location, and practice type. Responses of "usually" and "occasionally" were considered positive responses, and "rarely" and "never" were considered negative responses.

## RESULTS:

Survey responses are summarized in Table 1.

-For patients aged zero to six months, the most frequently chosen treatment option was a Pavlik harness with 204 positive responses. As surgeon age increased, Pavlik harness use decreased and spica cast use increased. Surgeons from the West were less likely to use Pavlik harnesses in this age group.

-For patients aged six months to five years, the most frequently chosen treatment was spica casting, with 142 positive responses for 1.5/2 leg spica and 175 positive responses for single leg spica. The frequency of positive responses for flexible intramedullary nails (FIN) increased with surgeon age. Surgeons from Canada or Mexico were more likely to choose traction with delayed spica than other regions. Surgeons from the Midwest, West, and Southwest more often provided a positive response for submuscular plating compared to other regions.

-For patients aged five to 11 years with length stable fractures, the most frequently chosen treatment was FIN with 219 positive responses. As surgeon age increased, they were more likely to consider nonoperative options. Academic centers were less likely to choose nonoperative choices than private practice or military settings.

-For patients aged five to 11 years with length unstable fractures, the most frequently chosen treatment was submuscular plate with 169 responses, followed closely by FIN and rigid intramedullary nail with 152 and 122 positive responses, respectively. Most responses favored operative choices, but as surgeon age increased, they were more likely to consider nonoperative options. Academic centers were less likely to choose nonoperative options than other practice settings.

-For patients aged 11 to 18 years, the most frequently chosen treatment was rigid intramedullary nailing with 221 positive responses. Submuscular plate and FIN were more often considered as treatment options as surgeon age increased.

## DISCUSSION AND CONCLUSION:

There are trends in practice patterns for the treatment of pediatric femoral shaft fractures based on surgeon age, practice location, and practice setting. The general trend in this study is that older surgeons choose from a broader array of treatment options. Older surgeons were more likely to choose spica casts in children younger than six months, and more likely to choose flexible nails and submuscular plates as surgical options in other age groups. Academic centers also choose nonoperative treatments less frequently in some age groups. This study identifies areas of variability in practice patterns. Further studies are warranted to inform more comprehensive clinical practice guidelines.

		Negative Responses		Positive Responses		
	i	Never	Rarely	Occasionally	Usually	
	Soft dressing	61	58	54	8	
		119		62		
0-6 months	Pavlik harness	6	8	17	187	
		14		204		
	1.5/2 leg spica cast	99	52	13	10	
		151		23		
	1 leg spica cast	99	54	16	5	
		153		21		
	Other	13	2	7	7	
		15		14		
6 months-5 years	Pavlik harness	90	56	22	2	
		146		24		
	1.5/2 leg spica cast	20	39	59	83	
		59		142		
	1 leg spica cast	14	18	55	120	
		32		175		
	Functional brace	120	36	18	6	
		156		24		
	Traction with delayed	151	17	4	3	
	spica	168		7		
	Submuscular plate	63	93	24	1	
		156		25		
	FIN	17	95	73	9	
		112		82		
	Other	11	3	1	0	
	1	14		1		

onses			1.5/2 leg spica cast	109	49	16	3		
Jsually				158		19		1	
8			1 leg spica cast	82	69	19	8		
					151	2	7		
187			Functional brace	151	23	3	1		
					174	4			
10			Traction with delayed	157	18	3	0		
		5-11 years, length	spica	175		3		5-11 years	5-11 years,
5		stable	stable Submuscular plate	55	84	39	3	- ·	unstabl
					139	4	2		
7			FIN	1	3	21	198	1	
				4		219			
2			Rigid IMN	39	66	80	1		
					105	8	1		
83			Other	12	3	1	0		
				15		1			
120									
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	1	1		221		
	Rigid IMN	0	1	12	209	
11-18 years		127		55		
	FIN	53	74	51	4	
		101		87		
5-11 years, length unstable	Submuscular plate	23	78	83	4	
		10		3		
	Other	9	1	1	2	
		72		122		
	Rigid IMN	24	48	98	24	
		55		152		
	FIN	19	36	93	59	
		45		169		
	Submuscular plate	13	32	79	90	
	spica	174		2		
	Traction with delayed	154	20	2	0	
		171		4		
	Functional brace	166	5	4	0	
		163		14		
	1 leg spica cast	128	35	11	3	
		166		15		
	1.5/2 leg spica cast	130	33	10	5	