

SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL MEETINGS OF THE KNEE SOCIETY

The New Knee Society Knee Scoring System

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In 1989, The Knee Society Clinical Rating System [3] was developed as a simple, but objective scoring system to rate the knee and patient's functional abilities such as walking and stair climbing before and after TKA. Since the scoring system did not include assessment of radiographs, The Knee Society endorsed a method to evaluate radiographs [2]. The Knee Society Clinical Rating System has been the most popular method of tracking and reporting outcomes after total and partial knee arthroplasty worldwide. However, the reliability, responsiveness, and validity of the original score

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have been challenged. In addition, it became clear over time that there were ambiguities and deficiencies with the original Knee Society Clinical Rating System that challenged its utility and validity in our contemporary patients, who often have expectations, demands, and functional requirements that are different from those of prior generations of patients who underwent knee arthroplasty.

The Knee Society therefore embarked on a complete review of the previous system. The project started more than 3 years ago and involved Knee Society members from 18 institutions in the United States and Canada; these individuals contributed more than 500 cases of both preoperative and postoperative TKA. The magnitude of this exhaustive project involved a multidisciplinary team of arthroplasty surgeons, epidemiologists, and statisticians. The prior objective knee score was amplified from the prior Knee Society score to incorporate current knee arthroplasty clinical parameters. The functional component of the new score was developed on the basis of comprehensive inventories of the activities and observations of 101 patients at five major knee arthroplasty centers who completed a 120-item survey, which was ultimately condensed down to the current assessment tool. This assessment tool was then included in the validation process at the 18 participating centers. The final scoring system was then approved by the Knee Society Scoring Committee.

The new Knee Society Knee Scoring System is both physician and patient derived. It includes versions to be administered preoperatively (Appendix 1) and postoperatively (Appendix 2). It has an initial assessment of demographic details, including an expanded Charnley functional classification [1]. The objective knee score, completed by the surgeon, includes a VAS score of pain walking on level ground and on stairs or inclines, as well as an assessment of alignment, ligament stability, and ROM,



along with deductions for flexion contracture or extensor lag. Patients then record their satisfaction, functional activities, and expectations. Given the diverse activity profiles of many contemporary patients, the functional component of the score was improved to include a patient-specific survey, which evaluates features such as standard activities of daily living, patient-specific sports and recreational activities, patient satisfaction, and patient expectations. Portions of the original Knee Society Clinical Rating System have been integrated into the new version to maintain the integrity of the prior version of the Knee Society score.

The new Knee Society Knee Scoring System has been developed and validated, in part, to better characterize the expectations, satisfaction, and physical activities of the younger and more diverse population of current patients undergoing TKA. The new score provides sufficient flexibility and depth to capture the diverse lifestyles and activities of our current patients. The score was validated in a thoughtful and methodical fashion confirming internal reliability and analyzed for differential item functioning [4].

The new Knee Society Scoring System is broadly applicable across sex, age, activity level, and implant type.

In conclusion, the new Knee Society Scoring System is a validated and responsive method for assessing objective and subjective outcomes after total and partial knee arthroplasty, without the ambiguities of the prior scoring system. As physicians, clinical practices, and health systems become increasingly more responsible for reporting patient outcomes, the clear value of this new scoring system will become apparent. The new scoring system is available through application on the Knee Society Web site (http://www.kneesociety.org).

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Appendix 1

KNEE SOCIETY SCORE: PRE-OP

1- Today's date	APHIC INFORMATION 2- Date of dates as: dd/yyyyy	(To be completed by patient) of birth
6- Side of this (symptomatic) knee	/eight (lbs.) 5- Sex ○ Male If both knees will be operated on, ple	○ Female
○ Left ○ Right	use a different form for each knee	
 7- Ethnicity Native Hawaiian or other Pacific Islander Arab or Middle Eastern African Ame 	○ American Indian or Alaska N rican or Black ○ Asian	lative O Hispanic or Latino O White
8- Please indicate the expected date and surger Date		nt operation
9- Will this be a primary or revision knee replacement of the second of	acement?	
To be completed by surgeon 10- Charnley Functional Classification (Us	e Code Below)	
A Unilateral Knee Arthritis	C1 TKR, but remote arthritis affe	ecting ambulation
B1 Unilateral TKA, opposite knee arthritic	C2 TKR, but medical condition a	ffecting ambulation
B2 Bilateral TKA	C3 Unilateral or Bilateral TKA wi	th Unilateral or Bilateral THR



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	OBJECTIVE KNEE INDICATORS	(To be completed by surgeon)
	ALIGNMENT	
1- Alignment: measured on	AP standing Xray (Anatomic Alignment)	25 point max
Neutral: 2-10 degree Varus: < 2 degrees v Valgus: > 10 degrees		
	INSTABILITY	
2- Medial / Lateral Instabilit	y: measured in full extension	15 point max
None Little or < 5 mm Moderate or 5 mm Severe or > 5 mm	(15 pts) (10 pts) (5 pts) (0 pts)	
3- Anterior / Posterior Insta	bility: measured at 90 degrees	10 point max
None Moderate < 5 mm Severe > 5 mm	(10 pts) (5 pts) (0 pts)	
	JOINT MOTION	
4- Range of motion (1 poi		
3 (1	G ,	
Deductions		
Flexion Contractur 1-5 degrees 6-10 degrees 11-15 degrees > 15 degrees	e (-2 pts) (-5 pts) (-10 pts) (-15 pts)	Minus Points
Extensor Lag <10 degrees 10-20 degrees	(-5 pts) (-10 pts)	Minus Points

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(-15 pts)



> 20 degrees

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			SYM	PTON	/IS		(To be co	mpleted by patient)
1- Pain with level wa	alking							(10 - Score)
0 1 2	2 3	4	5 6	7	8	9	10	
none							severe	
2- Pain with stairs o	r inclines	•						(10 - Score)
0 1 2	2 3	4	5 6	7	8	9	10	
none							severe	
3- Does this knee fe	el "norma	al" to you?						(5 points)
Always (5 pts)	Sometim	es (3 pts)	O Never (0 pts))				
Very Satisfied (8 pts)	Satisfied (6 pts)	_	al O Dissati	-		y Dissa	_	(8 points)
2- Currently, how sa	itisfied ar	e you with t	he pain level o	f your k	nee wh	nile lyin	ıg in bed?	(8 points)
Very Satisfied (8 pts)	Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	_	y Dissat (0 pts)	tisfied		
B- Currently, how sa	tisfied ar	e you with y	our knee func	tion wh	ile getti	ing out	of bed?	(8 points)
O Very Satisfied (8 pts)	Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	d OV	ery Diss (0 pts)	satisfied		
l- Currently, how sa light household d		e you with y	our knee func	tion wh	ile perf	orming		(8 points)
Very Satisfied (8 pts)	Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	O Ve	ery Diss (0 pts)			
Currently, how sat recreational activit		you with yo	our knee functi	ion whil	e perfo	rming	leisure	(8 points)
Very Satisfied OS (8 pts)	Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)		y Dissa (0 pts)	tisfied		
			Ma	ximum	total r	ooints	(40 points)	

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(To be completed by patient) **PATIENT EXPECTATIONS**

What do you expect to accomplish with your knee replacement:	
1- Do you expect your knee joint replacement surgery will relieve your knee pain?	(5 points)
O no, not at all (1 pt)	
O yes, a little bit (2 pts)	
O yes, somewhat (3 pts)	
O yes, a moderate amount (4 pts)	
O yes, a lot (5 pts)	
2- Do you expect your surgery will help you carry out your normal activities of daily living?	(5 points)
O no, not at all (1 pt)	
O yes, a little bit (2 pts)	
O yes, somewhat (3 pts)	
O yes, a moderate amount (4 pts)	
O yes, a lot (5 pts)	
3- Do you expect you surgery will help you perform leisure, recreational or sports activities?	(5 points)
O no, not at all (1 pt)	
O yes, a little bit (2 pts)	
O yes, somewhat (3 pts)	
O yes, a moderate amount (4 pts)	
O yes, a lot (5 pts)	
Maximum total points (15 points)	



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(To be completed by patient) **FUNCTIONAL ACTIVITIES**

WALKING AND STANDING (30 points)					
1 - Can you walk without any ○ Yes ○ No	aids (such as a cane, crutches	or wheelchair)?	(0 points)		
	alker (-8 pts) O crutches (-8	3 pts) O two canes (-6 pts)	(-10 points)		
O other					
3 - Do you use these aid(s) be ○ Yes ○ No	ecause of your knees?		(0 points)		
4 - For how long can you star	nd (with or without aid) before s	sitting due to knee discomfort?	(15 points)		
O cannot stand (0 pts)	O 0-5 minutes (3 pts)	O 6-15 minutes (6 pts)			
O 16-30 minutes (9 pts)	O 31-60 minutes (12 pts)	O more than an hour (15 pts)			
5 - For how long can you wall	k (with or without aid) before st	opping due to knee discomfort?	(15 points)		
O cannot walk (0 pts)	O 0-5 minutes (3 pts)	O 6-15 minutes (6 pts)			
○ 16-30 minutes (9 pts)	○ 31-60 minutes (12 pts)	O more than an hour (15 pts)			
		Maximum points (30 points)			



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	STANDA	KU A	CIIVIIIES	30 p	oints)		
How much does your knee bother you during each of the following activities?	no bother	slight	moderate	severe	very severe	of knee)	I never
	5	4	3	2	1	0	I
1 - Walking on an uneven surface	0	0	0	0	0	0	0
2 - Turning or pivoting on your leg	0	0	0	0	0	0	0
3 - Climbing up or down a flight of stairs	0	0	0	0	0	0	0
4 - Getting up from a low couch or a chair without arms	0	0	0	0	0	0	0
5 - Getting into or out of a car	0	0	0	0	0	0	0
6 - Moving laterally (stepping to the side)	0	0	0	0	0	0	0
				Maxi	imum p	oints (30 p	oints)
	ADVANO	CED A	CTIVITIES	S (25 p	oints)		
1 - Climbing a ladder or step stool	0	0	0	0	0	0	0
2 - Carrying a shopping bag for a block	0	0	0	0	0	0	0
3 - Squatting	0	0	0	0	0	0	0
4 - Kneeling	0	0	0	0	0	0	0
5 - Running	0	0	0	0	0	0	0



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DISCRETIONARY KNEE ACTIVITIES (15 points)

Please check 3 of the activities below that you consider *most important* to you.

(Please do not write in additional activities)

Recreational Activities	Workout and Gym Activities				
☐ Swimming	☐ Weight-lifting				
☐ Golfing (18 holes)	☐ Leg Extensions				
☐ Road Cycling (>30mins)	☐ Stair-Climber				
☐ Gardening	☐ Stationary Biking / Spinning				
☐ Bowling	☐ Leg Press				
☐ Racquet Sports (Tennis, Racquetball, etc.)	☐ Jogging				
☐ Distance Walking	☐ Elliptical Trainer				
□ Dancing / Ballet	☐ Aerobic Exercises				
☐ Stretching Exercises (stretching out your muscles)					
Please copy all 3 checked activities in	nto the empty boxes below.				
Please copy all 3 checked activities into the empty boxes below. How much does your knee bother you during each of these activities?					

How much does y	How much does your knee bother you during each of these activities?					
Activity (Please write the 3 activites from list above)	no bother	slight	moderate	severe	very severe	cannot do (because of knee)
	5	4	3	2	1	0
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
			Maxir	num poir	nts (15 p	oints)
			Maximum t	otal poin	ts (100 p	oints)



Appendix 2

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	3.

KNEE SOCIETY SCORE: POST-OP

DEMOGRAPHIC INFORMATION (To be completed by patient 1- Today's date Demographic information 2- Date of birth 2- Date of)
3- Height (ft' in") 4- Weight (lbs.) Male O Female	
6- Side of this (surgically treated) knee Side of this (surgically treated) knee If both knees have been operated on, please use a different form for each knee	
7- Ethnicity O Native Hawaiian or other Pacific Islander O American Indian or Alaska Native O Hispanic or Lati O Arab or Middle Eastern O African American or Black O Asian O White	no
8- Please indicate date and surgeon for your knee replacement operation Date Name of Surgeon Lenter dates as: mm/dd/yyyy	
9- Was this a primary or revision knee replacement? ○ Primary ○ Revision	
To be completed by surgeon 10- Charnley Functional Classification (Use Code Below)	
A Unilateral Knee Arthritis C1 TKR, but remote arthritis affecting ambulation	
B1 Unilateral TKA, opposite knee arthritic C2 TKR, but medical condition affecting ambulation	
B2 Bilateral TKA C3 Unilateral or Bilateral TKA with Unilateral or Bilateral THR	



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OBJECTIVE KNEE INDICATORS

(To be completed by surgeon)

	ALIGNMENT	
1- Alignment: measured on AP star	ding Xray (Anatomic Alignment)	25 point max
Neutral: 2-10 degrees valgus Varus: < 2 degrees valgus Valgus: > 10 degrees valgus	(25 pts) (-10 pts) (-10 pts)	

ledial / Lateral Instabilit	y: measured in full extension	15 point max
None Little or < 5 mm Moderate or 5 mm Severe or > 5 mm	(15 pts) (10 pts) (5 pts) (0 pts)	
Anterior / Posterior Insta	bility: measured at 90 degrees	10 point max
None Moderate < 5 mm Severe > 5 mm	(10 pts) (5 pts) (0 pts)	

	JOINT MOTIC	DN
4- Range of motion (1 poi	nt for each 5 degrees)	
Deductions		
Flexion Contractu	e	Minus Points
1-5 degrees	(-2 pts)	
6-10 degrees	(-5 pts)	
11-15 degrees	(-10 pts)	
> 15 degrees	(-15 pts)	
Extensor Lag		Minus Points
<10 degrees	(-5 pts)	
10-20 degrees	(-10 pts)	
> 20 degrees	(-15 pts)	



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			SYMPTO	MS	(To be con	pleted by patient)
1- Pain with lev	vel walking					(10 - Score)
0 1	2 3	4 5	6 7	8	9 10	
none					severe	
2- Pain with sta	airs or inclines					(10 - Score)
0 1	2 3	4 5	6 7	8	9 10	
none		·			severe	
3- Does this kne	ee feel "normal"	to you?				(5 points)
O Always (5 pts)	O Sometimes	(3 pts) O N	ever (0 pts)			
			Maximur	n total poir	nts (25 points)	
		PATIE	ENT SATISF	-	, , ,	
1- Currently, ho	w satisfied are y	ou with the p	ain level of your	knee while	sitting?	(8 points)
O Very Satisfied (8 pts)	O Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	O Very Dis (0 pts)	ssatisfied	
2- Currently, ho	w satisfied are y	ou with the p	ain level of your	knee while	lying in bed?	(8 points)
O Very Satisfied	O Satisfied	O Neutral	O Dissatisfied	O Very Di	ssatisfied	
(8 pts)	(6 pts)	(4 pts)	(2 pts)	(0 pts)		
_	_	·	knee function w			(8 points)
O Very Satisfied (8 pts)	○ Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	O Very Di (0 pts)	ssatisfied	
,	w satisfied are y		knee function w		ing	(8 points)
O Very Satisfied	 Satisfied 	O Neutral	O Dissatisfied	O Very D	Dissatisfied	
(8 pts)	(6 pts)	(4 pts)	(2 pts)	(0 pts)		
5- Currently, ho recreational ac	w satisfied are yetivities?	you with your	knee function w	hile perform	ning leisure	(8 points)
O Very Satisfied (8 pts)	O Satisfied (6 pts)	O Neutral (4 pts)	O Dissatisfied (2 pts)	O Very I (0 pts)	Dissatisfied	
			Maximun	n total poir	its (40 points)	



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PATIENT EXPECTATION

(To be completed by patient)

Compared to what you expected before your knee replacement:	
1- My expectations for pain relief were	(5 points)
○ Too High- "I'm a lot worse than I thought" (1 pt)	
○ Too High- "I'm somewhat worse than I thought" (2 pts)	
O Just Right- "My expectations were met" (3 pts)	
○ Too Low- "I'm somewhat better than I thought" (4 pts)	
○ Too Low- "I'm a lot better than I thought" (5 pts)	
2- My expectations for being able to do my normal activities of daily living were	(5 points)
○ Too High- "I'm a lot worse than I thought" (1 pt)	
○ Too High- "I'm somewhat worse than I thought" (2 pts)	
O Just Right- "My expectations were met" (3 pts)	
O Too Low- "I'm somewhat better than I thought" (4 pts)	
○ Too Low- "I'm a lot better than I thought" (5 pts)	
3- My expectations for being able to do my leisure, recreational or sports activities were	re (5 points)
○ Too High- "I'm a lot worse than I thought" (1 pt)	(4)
○ Too High- "I'm somewhat worse than I thought" (2 pts)	
O Just Right- "My expectations were met" (3 pts)	
○ Too Low- "I'm somewhat better than I thought" (4 pts)	
J ,	
○ Too Low- "I'm a lot better than I thought" (5 pts)	
Maximum total points (15	points)



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FUNCTIONAL ACTIVITIES (To be completed by patient)

	WALKING AND STANDI	NG (30 points)	
1 - Can you walk without any O Yes O No	y aids (such as a cane, crutches	or wheelchair)?	(0 points)
2 - If no, which of the following wheelchair (-10 pts)	ing aid(s) do you use? valker (-8 pts) O crutches (-8	3 pts) O two canes (-6 pts)	(-10 points)
O one crutch (-4 pts) O of	ne cane (-4 pts) O knee sleeve	e / brace (-2 pts)	
3 - Do you use these aid(s) books of Yes of No	because of your knees?		(0 points)
4 - For how long can you sta	and (with or without aid) before s	sitting due to knee discomfort?	(15 points)
O cannot stand (0 pts)	O 0-5 minutes (3 pts)	O 6-15 minutes (6 pts)	
O 16-30 minutes (9 pts)	O 31-60 minutes (12 pts)	O more than an hour (15 pts)	
5 - For how long can you wa	lk (with or without aid) before st	opping due to knee discomfort?	(15 points)
O cannot walk (0 pts)	O 0-5 minutes (3 pts)	O 6-15 minutes (6 pts)	
O 16-30 minutes (9 pts)	O 31-60 minutes (12 pts)	O more than an hour (15 pts)	
		Maximum points (30 points)	



	STAND	ARD A	CTIVITIES	30 p	oints)			Page (
How much does your knee bother you during each of the following activities?	no bothe	er slight 4	moderate 3	severe	very severe	cannot do (because of knee)	I never do this	
1 - Walking on an uneven surface	0	0	0	0	0	0	0	
2 - Turning or pivoting on your leg	0	0	0	0	0	0	0	
3 - Climbing up or down a flight of stairs	0	0	0	0	0	0	0	
4 - Getting up from a low couch or a chair without arms	0	0	0	0	0	0	0	
5 - Getting into or out of a car	0	0	0	0	0	0	0	
6 - Moving laterally (stepping to the side)	0	0	0	0	0	0	0	
				Maxim	num poi	nts (30 poi	nts)	
	ADVAN	NCED A	CTIVITIES	S (25 p	oints)			
1 - Climbing a ladder or step stool	0	0	0	0	0	0	0	
		_				0		
2 - Carrying a shopping bag for a block	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	
a block								



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DISCRETIONARY KNEE ACTIVITIES (15 points)

Please check 3 of the activities below that you consider *most* important to you.

(Please do not write in additional activities)

☐ Swimming	☐ Weight-lifting
☐ Golfing (18 holes)	□ Leg Extensions
☐ Road Cycling (>30mins)	☐ Stair-Climber
☐ Gardening	☐ Stationary Biking / Spinning
☐ Bowling	☐ Leg Press
☐ Racquet Sports (Tennis, Racquetball, etc.)	☐ Jogging
□ Distance Walking	☐ Elliptical Trainer
□ Dancing / Ballet	☐ Aerobic Exercises
☐ Stretching Exercises (stretching out your muscles)	
,	

riease copy all 5 checked activities into the empty boxes below.

Activity (Please write the 3 activites from list above)	no bother	slight 4	moderate	severe	very severe	cannot do (because of knee)
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
			Maxir	num poir	nts (15 p	oints)
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