



ATTIVITÀ FISICA ADATTATA E ARTROPROTESI DI GINOCCHIO

**A.O. Santa Croce e Carle
CUNEO**



**U.O. Ortopedia e
Traumatologia**

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Dr. Roberto Chiarpenello
Dr. Vincenzo Ciriello

L'ARTROPROTESI TOTALE DEL GINOCCHIO

American Joint Registry: il numero di PTG è destinato ad aumentare del 85%

1.260.000 procedure all'anno entro il 2030 negli Stati Uniti

Population has changed!



ATTIVITÀ FISICA E ARTROPROTESI

La pratica regolare AF riduce mortalità e morbidità

Nei portatori di artroprotesi la pratica regolare della AF:

- Riduce il rischio di cadute e aumenta la densità ossea
- Migliora la fissazione delle componenti protesiche
- Aumenta la capacità di svolgere attività quotidiane a tutte le età

Schmalzried 2004

Defining Adapted Physical Activity: International Perspectives

Yeshayahu Hutzler
Zinman College

Claudine Sherrill
Texas Woman's University

APA is defined as a cross-disciplinary body of knowledge directed toward the identification and solution of individual differences in physical activity. It is a service delivery profession and an academic field of study that supports an attitude of acceptance of individual differences, advocates access to active lifestyles and sport, and promotes innovation and cooperative service delivery programs and empowerment systems. Adapted physical activity includes, but is not limited to, physical education, sport, recreation, dance and creative arts, nutrition, medicine, and rehabilitation. (IFAPA, 2004)

RISCHI LEGATI ALL'ATTIVITÀ SPORTIVA: L'USURA



Volume detriti **direttamente proporzionale** al **numero di passi** compiuti ed **esponenzialmente proporzionale** al **carico** e alla **rugosità** delle superfici di accoppiamento

Schmalzried et al. Clin Orthop 2000

La popolazione di portatori di protesi che partecipa ad attività atletiche, i risultati clinici e la sopravvivenza degli impianti risultano persino aumentati rispetto ai pazienti non attivi

Seyler et al. Sports Med. 2006

Allowed Activities After Primary Total Knee Arthroplasty and Total Hip Arthroplasty

Wissam S. Fawaz, MD, Bassam A. Masri, MD, FRCSC*

Orthop Clin N Am 51 (2020) 441–452
<https://doi.org/10.1016/j.jocl.2020.06.002>
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Knee joint loading during different activities

Activity	Knee Joint Load ($\times$ BW)
Walking at 5.4 km/h	3.4–4
Walking	3.0
Walking at 5 km/h	2.8
Walking at 7 km/h	4.3
Walking	3.5
Cycling at 120 W	1.2
Stair ascent	4.3
Stair ascent	5.0
Stair descent	3.8
Stair descent	6
Ramp ascent	4.5
Ramp descent	4.5
Ramp descent at 5.4 km/h	7–8.5
Squat descent	5.6
Isokinetic knee extension	Up to 9
Jogging at 9 km/h	8–9
Jogging at 12.6 km/h	10.3
Running at 16 km/h	Up to 14
Bowling on asphalt alleys	Up to 12
Skiing medium steep slope	
Beginner	10
Skilled skier	3.5



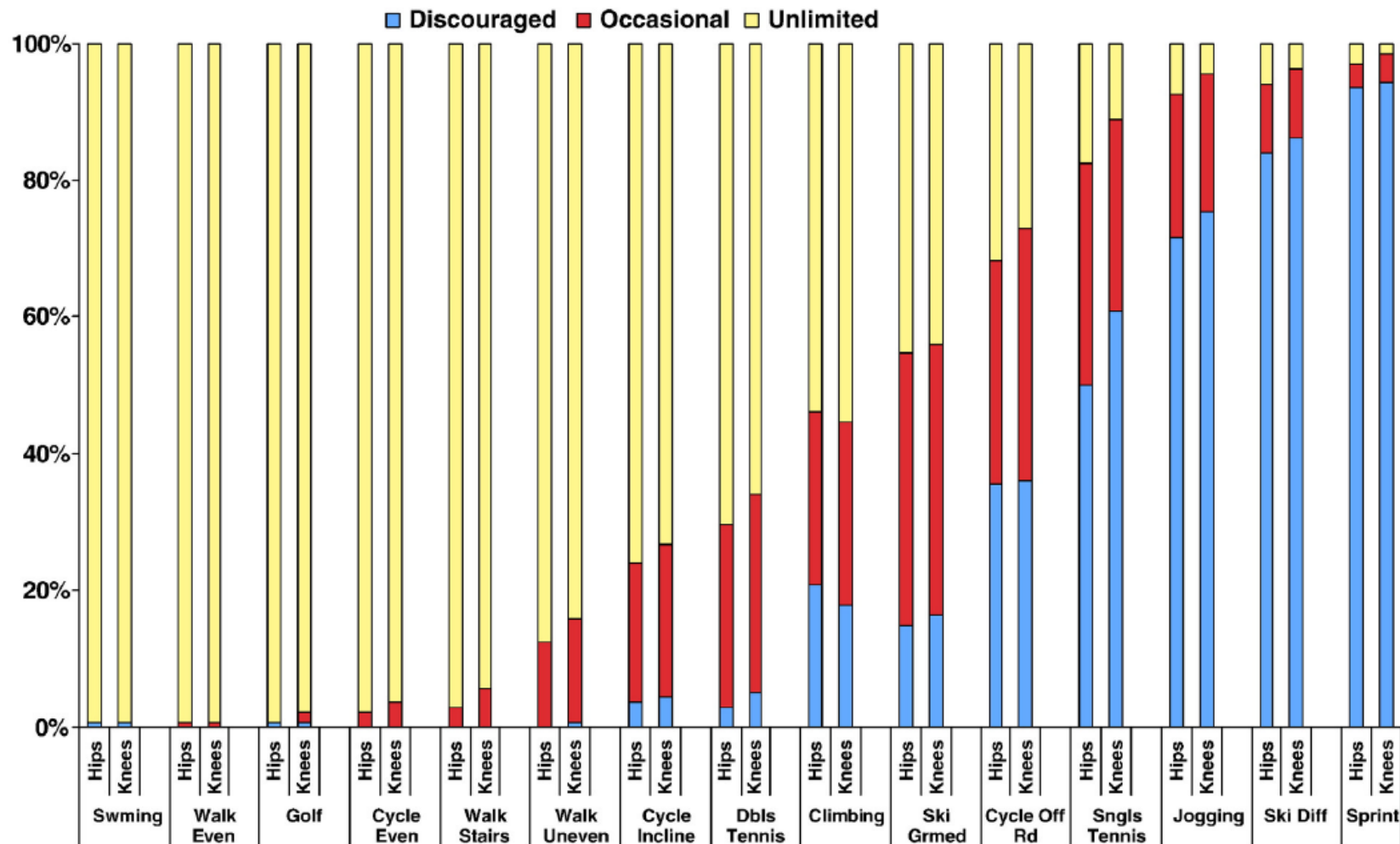
Activity Recommendations After Total Hip and Knee Arthroplasty

A Survey of the American Association for Hip and Knee Surgeons

Eli A. Swanson, MD,* Thomas P. Schmalzried, MD,† and Frederick J. Dorey, PhD‡

Survey su 657 membri
dell'American
Association for Hip and
Knee Surgeons

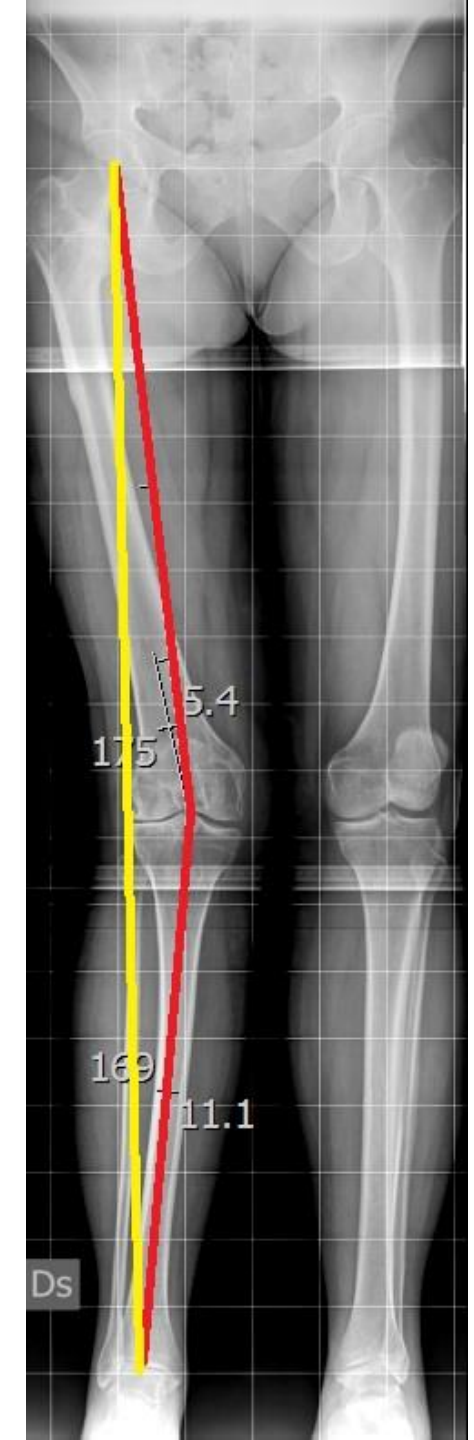
15 tipi di attività fisica

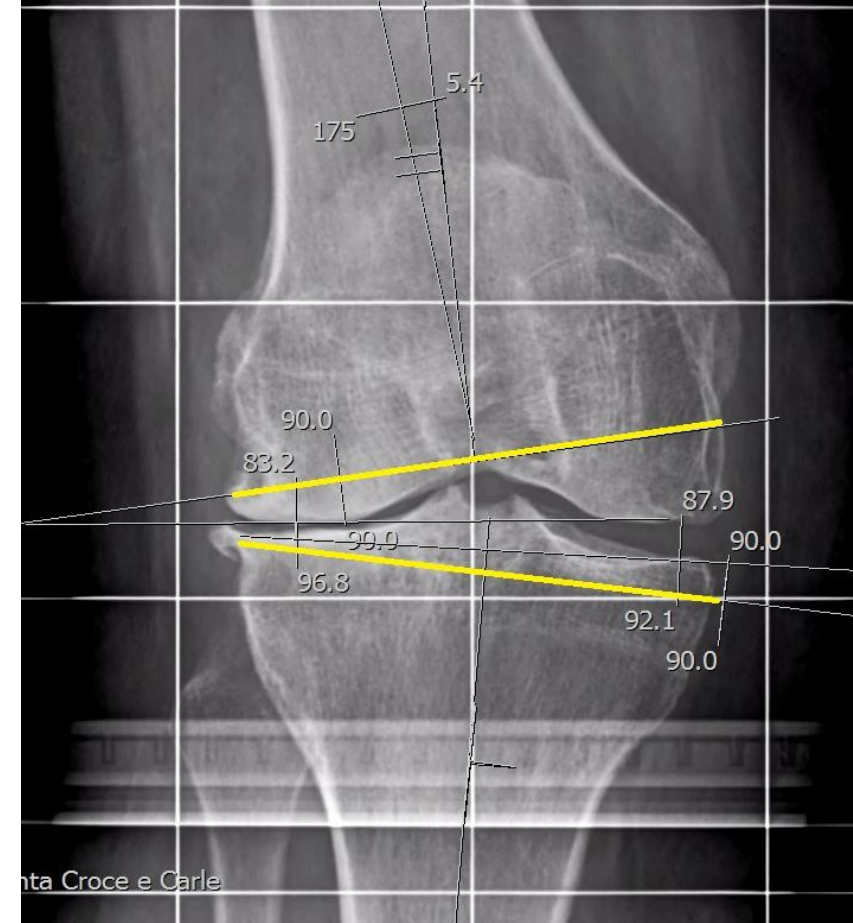


ATTIVITÀ FISICA ADATTATA: PROBLEMI

- Pianificazione chirurgica e scelta dell'impianto
- Fino al 20% dei pazienti **insoddisfatti**: aspettative del paziente e potenzialità dell'intervento
- Considerare il problema dell'AF!

PLANNING PREOPERATORIO





PLANNING PREOPERATORIO

MyKnee Surgical Planning Report

CASE CODE M_GHI_RSK_RC_03081965
SURGEON Roberto Chiarpenello
SURGERY DATE 2020-02-10
SURGICAL APPROACH Lateral
PRODUCT GMK-Sphere
BLOCKS LBS+STD

**PRE-OP
LONG AXIS**



CAUTION

This case is based on CT data:

**REMOVE FROM THE BONE
THE CARTILAGE AND SOFT
TISSUES COVERING THE
CUTTING BLOCK CONTACT
AREAS.**

All measurements shown are
from the bone and do not include
the thickness of the cartilage.

RIGHT TOTAL KNEE	PRE-OP	POST-OP
HKA	189.5	180.0
Femoral Valgus (from bone)	7.0	0.0
Tibial Varus (from bone)	0.5	0.0
Tibia Posterior Slope	9.0	2.0
Epicondyles vs Post. Cond.	10.0	

IMPLANTS	DEFAULT	CHANGED
Femoral Implant Size	4	4+
Tibial Implant Size	t3i4	4

FEMUR



	DEFAULT	CHANGED
FEMORAL RESECTIONS [mm]		
Lateral Posterior Cut	8	7
Medial Posterior Cut	8	7
Lateral Distal Cut	2.5	
Medial Distal Cut	9	
FEMORAL ANGLES [deg]		
Varus	0	
Flexum	0	
ROTATION [deg]		
External Rotation vs. Post. Condyles	0	

CAUTION

Accurately clear the posterior condyles from
any osteophytes and overhanging bone.



TIBIA



	DEFAULT	CHANGED
TIBIAL RESECTIONS [mm]		
Lateral Tibial Cut	9	2.5
Medial Tibial Cut	8.5	2
TIBIAL ANGLES [deg]		
Varus	0	
Posterior Slope	2	

COMMENTS

Per favore preparare planning
anche per semivincolata in caso
di inadeguato bilanciamento
Grazie

OTTO CARICO

Ds

Ds

TO CARICO

The clinical challenge

Patient dissatisfaction

- I miglioramenti clinici sono significativamente migliori dopo protesi di anca rispetto al ginocchio
- Una “forgotten hip” è molto più comune di un “forgotten knee”
- Le aspettative del paziente non sono soddisfatte così bene dopo TKA rispetto a THA:

20% TKA patients are not satisfied



10% THA patients are not satisfied



Behrend H et al. The “forgotten joint” as the ultimate goal in joint arthroplasty: validation of a new patient-reported outcome measure. J Arthroplasty. 2012 Mar;27(3):430-436.

Bourne R et al. Patient Satisfaction after Total Knee Arthroplasty: Who is Satisfied and Who is Not? Clin Orthop Relat Res. Jan 2010; 468(1): 57-63.

Bourne R et al, Comparing patient outcomes after THA and TKA: is there a difference? Clin Orthop Relat Res. 2010 Feb;468(2):542-6.

Dr. M.A.R. Freeman

Dr. M.A.R. Freeman

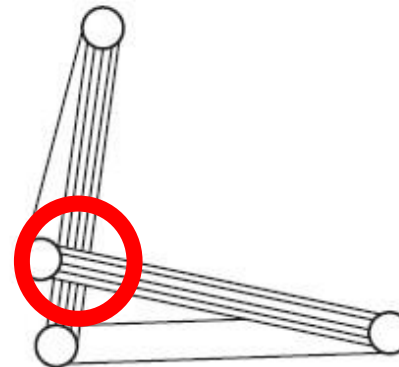
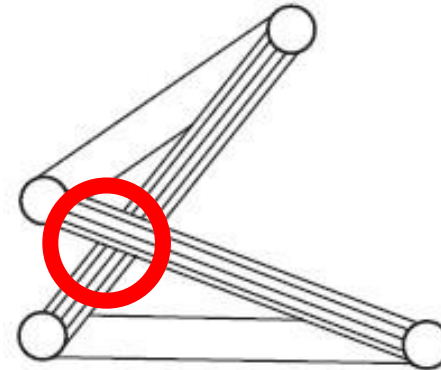
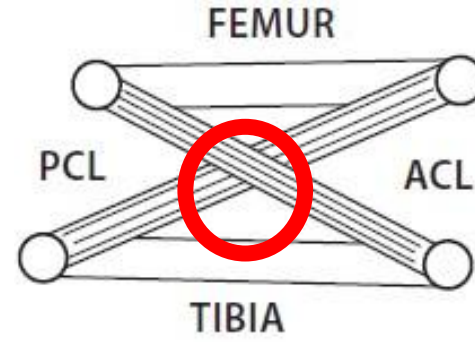
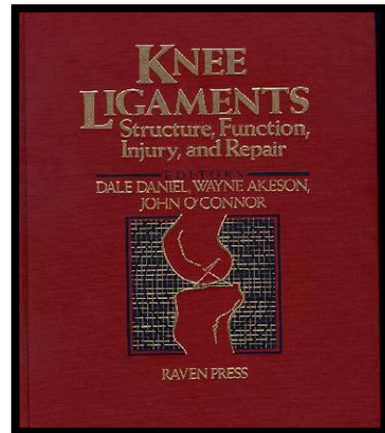


“...even having implanted thousands of knee prosthesis all along my life, I always suspected that we were not restoring the correct knee movement.....”

Four-Bar Link Theory

The geometry of the knee in the sagittal plane

J J O'Connor, BE, MA, PhD, T L Shercliff, BA and E Biden*, DPhil
Department of Engineering Science, University of Oxford
J W Goodfellow, MS, FRCS
Nuffield Orthopaedic Centre, Oxford

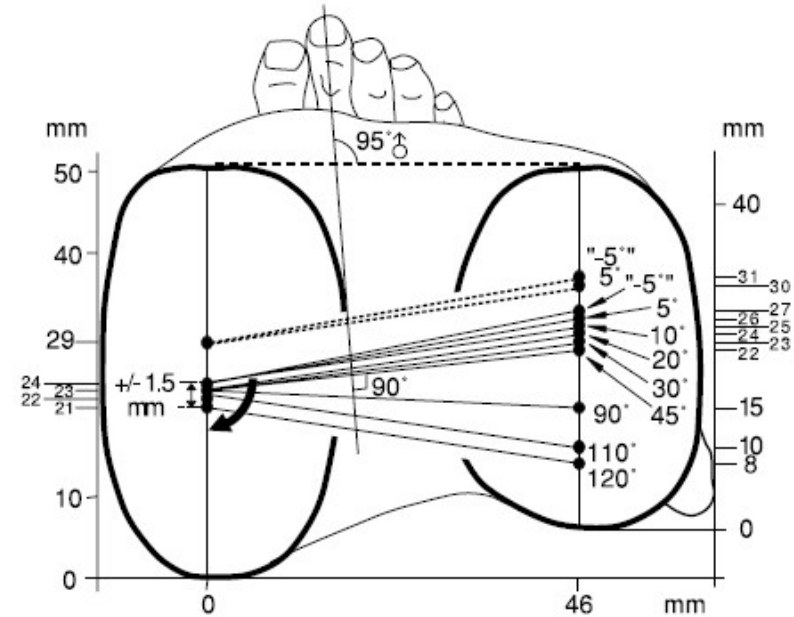


Natural knee kinematic studies

TIBIA

Il compartimento
mediale resta stabile

Il compartimento
laterale si muove
antero-posteriormente
per seguire la rotazione



Tibiofemoral movement 1: the shapes and relative movements of the femur and tibia in the unloaded cadaver knee

H. Iwaki, V. Pinskerova, M. A. R. Freeman

From the Charles University, Prague, Czech Republic

Natural knee kinematic studies



3-D Morphology of the Distal Femur Viewed in Virtual Reality

(AAOS 2001 annual meeting - Scientific Exhibit No. SE28)

Donald G Eckhoff, MD, Denver, CO

Thomas F Dwyer, MD, Denver, CO

Joel M Bach, PhD, Aurora, CO

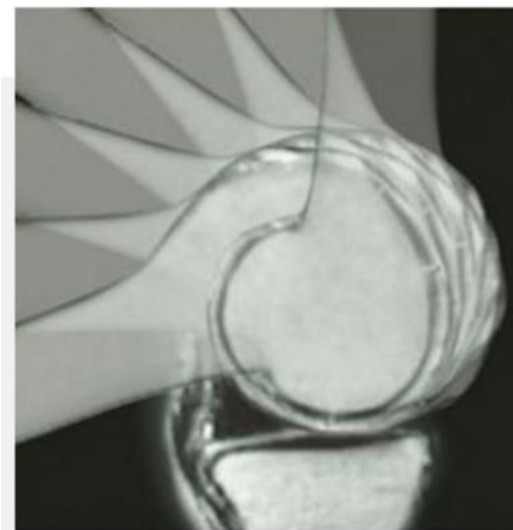
Victor M Spitzer, PhD, Aurora, CO

Karl D Reinig, PhD, Aurora, CO

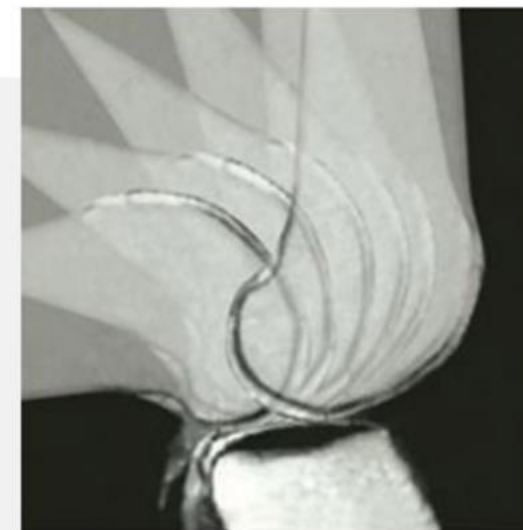
“Note that the radius of the cylinder fit to the medial femoral condyle is slightly larger in radius compared to the cylinder fit to the lateral femoral condyle, but the center of each cylinder lies on a single axis.”

MODELLI PROTESICI E BIOMECCANICA: MEDIAL PIVOT

- Più di 300 impianti presso il nostro centro dal 2013
- Alto tasso di soddisfazione con buoni risultati clinici e funzionali
- Nessun fallimento



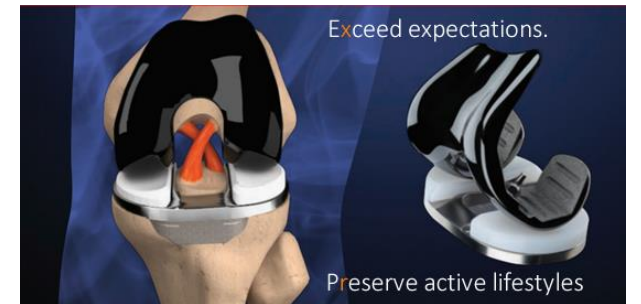
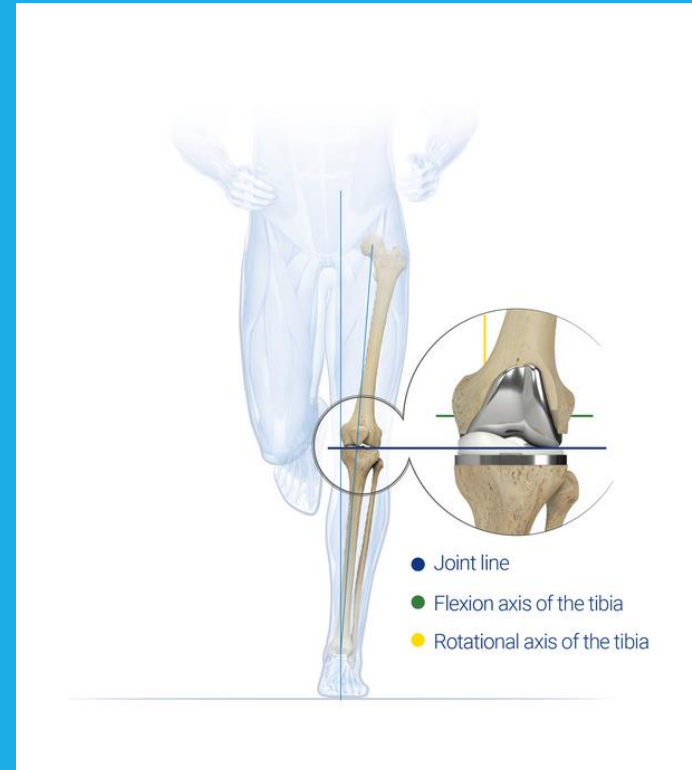
Stable Medial Compartment



Mobile Lateral Compartment

SOLUZIONI ALTERNATIVE

- Allineamento cinematico
- Protesi conservative:
 - Bi – cruciate retaining
 - Bi – unicompartimentali



Patient Satisfaction After Total Knee Arthroplasty

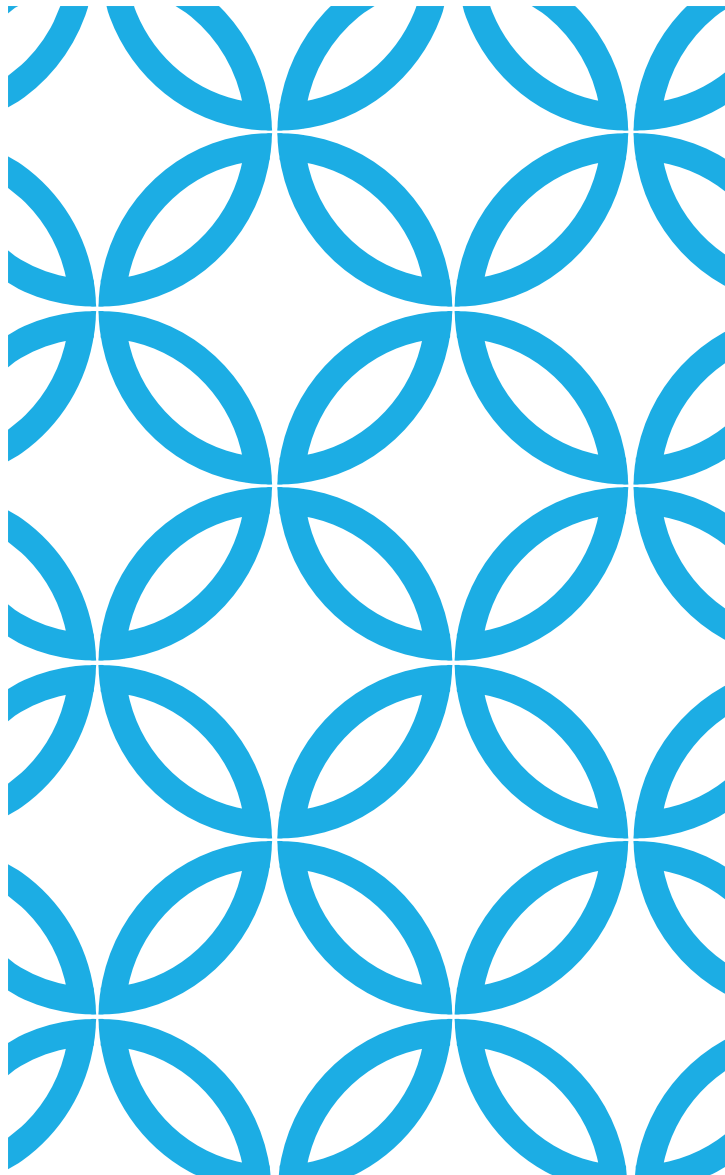
A Realistic or Imaginary Goal?

Emmanuel Gibon, MD, PhD, Marla J. Goodman, BA, MA (Int Rel),
Stuart B. Goodman, MD, PhD*

Factors affecting patient satisfaction after total knee arthroplasty		
Primary Factors	Details	Effect on Satisfaction
Patient-associated factors	Associated musculoskeletal issues	↑ Dissatisfaction
	Self-reported allergies	↑ Dissatisfaction
	Isolated and less destabilizing knee osteoarthritis	↑ Dissatisfaction
	Knee-related issues for a longer period	↑ Satisfaction
	Fulfillment of preoperative expectations	↑ Satisfaction
	Educational classes	↑ Satisfaction
	Patient age	Controversial
Surgical factors	Surgical approach	Controversial
	Alignment	Controversial
Prosthesis factors	High-flexion implants	Controversial
	Flexion needed to accomplish most activities	Controversial
Perioperative factors	Efficient pain management	↑ Satisfaction
	Poststructured postoperative exercise programs	↑ Satisfaction
Factors associated with nursing and general medical care	Higher level of general care	↑ Satisfaction
	Decreased length of hospital stay	↑ Satisfaction

TAKE HOME MESSAGES:

- Le recenti innovazioni tecnologiche permettono il raggiungimento di maggiori tassi di soddisfazione dopo TKA con conseguente aumento del ritorno alla AF
- Fondamentale la corretta selezione del paziente e la corretta EDUCAZIONE e COMUNICAZIONE prima dell'intervento
- Approccio MULTIDISCIPLINARE fondamentale



GRAZIE
