

A.O. Santa Croce e Carle CUNEO
U.O. Ortopedia e Traumatologia
Direttore f.f. dr. Roberto Chiarpenello

ATTIVITÀ FISICA ADATTATA E ARTROPROTESI DI ANCA

Dr. Vincenzo Ciriello

Dr. Roberto Chiarpenello

L'ARTROPROTESI TOTALE DELL'ANCA

- American Joint Registry: il numero di PTA è destinato ad aumentare del 71%
- 635.000 procedure all'anno entro il 2030 negli Stati Uniti
- *Population has changed!*



ATTIVITÀ FISICA E ARTROPROTESI DI ANCA

- La pratica regolare AF riduce mortalità e morbidità
- Nei portatori di ATA 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.ocl.2020.06.002>
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Hip joint loading during different activities

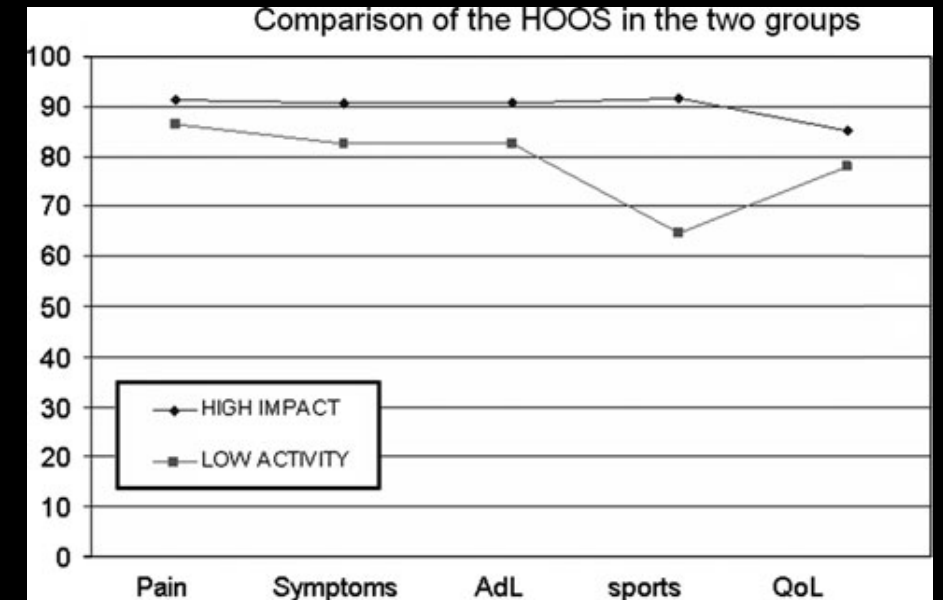
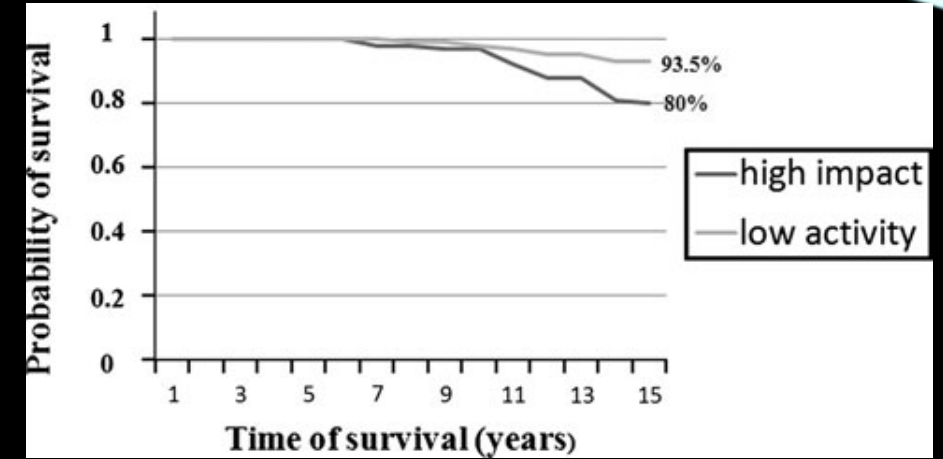
Activity	Hip Joint Load ($\times$ BW)
Standing on 2 legs	0.8
Standing on 1 leg	3.2
Straight leg raise	1.9
Walking at 1 km/h	2.9
Walking at 5 km/h	4.7
Jogging at 5 km/h	5.0
Jogging at 7 km/h	5.4
Stumbling	8.7
Cycling low resistance (40 W)	0.5
Cycling high resistance	1.4
Jogging at 12 km/h	6
Alpine skiing long turns, flat slope	4.5
Alpine skiing long turns, steep slope	6
Alpine skiing short turns, flat slope	5.5–6
Alpine skiing short turns, steep slope	7–8
Alpine skiing small moguls	8–9
Alpine skiing large moguls	10–15
Cross-country skiing classical	4–5
Cross-country skiing skating	4.5
Walking at natural speed	3.2–6.2
Stair ascent	3.4–6
Car entry	5–8
Car exit	4.5–8
Bath entry	4.6–6.6
Stair ascent	5
Stair descent	5.6
Ramp ascent	6.8
Ramp descent	6.5

SYMPOSIUM: PAPERS PRESENTED AT THE 2011 MEETING OF THE INTERNATIONAL HIP
SOCIETY

Does Impact Sport Activity Influence Total Hip Arthroplasty Durability?

Matthieu Ollivier MD, Solenne Frey MD,
Sebastien Parratte MD, PhD, Xavier Flecher MD, PhD,
Jean-Noël Argenson MD

- Miglioramento clinico significativo HIG
- Nessuna differenza nel tasso di lussazione
- Aumentato tasso di usura per HIG e M sex
- A 15 anni di F-Up sopravvivenza nel HIG del 80% e 93.5% nel LIG ($p < 0.001$)



Return to Sporting Activity After Total Hip Arthroplasty—A Survey of Members of the British Hip Society

Benjamin M. Bradley, MBBS, BSc (Hons), FRCS (Tr & Orth)^{a, *},
 Stephen J. Moul, MBBS, BSc (Hons)^a, Fintan J. Doyle, MBBCh, MSc, FRCS^b,
 Matthew J. Wilson, MBBS, FRCS (Tr & Orth)^a

- 260 ortopedici della British Hip Society
- 22 attività sportive suddivise per intensità

Time Interval Recommended Before Allowing Return to Sporting Activities After Total Hip Arthroplasty (THA).

Time After THA	Proportion of BHS Members: % (Number of Responses)
As soon patient feels able	3.9 (4)
6 wk	6.8 (7)
6-12 wk	36.9 (38)
> 12 wk	43.7 (45)
Other	8.7 (9)
No response	(6)

BHS, British Hip Society.

Changes in Surgeon Practice Related to Total Hip Arthroplasty (THA) in Sporting Patient Over Last 5 y/Since Appointment.

	Proportion of BHS Members: % (Number of Responses)	
	Yes	No
Increased activity permitted	35.6 (36)	54.4 (55)
Decreased time to start sports	18.3 (18)	67.3 (66)
Bearing surface	43.4 (43)	46.4 (46)

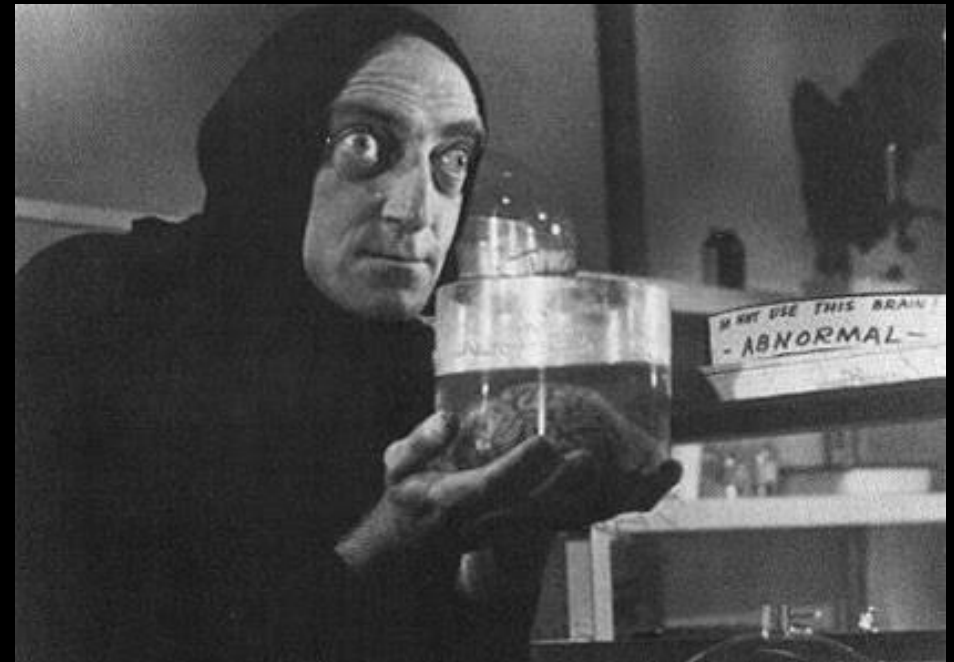


British Hip Society (BHS) Responses for Return to Sporting Activity After Total Hip Arthroplasty (THA) Classified According to Impact Category.

Sport	BHS Recommendation			
	Allow (%)	Allow with Experience (%)	Not Allowed (%)	Undecided (%)
Low impact				
Golf	97.2	2.8	0	0
Swimming	98.1	1.9	0	0
Walking	99.1	0.9	0	0
Cross-training	98.1	1.9	0	0
Static cycling	99.1	0.9	0	0
Intermediate impact				
Cycling	95.2	4.8	0	0
Hiking	94.3	5.7	0	0
Dancing	87.6	12.4	0	0
Weight lifting (high weight/low reps)	27.6	23.8	44.8	3.8
Ice skating/roller blading	42.9	31.4	24.8	1.0
Rowing	65.7	23.8	8.6	1.9
Bowling	90.5	8.6	1.0	0
Low-impact aerobics	87.6	11.4	1.0	0
High impact				
Contact sports	9.5	14.3	75.2	1.0
Jogging (road)	21.9	17.1	59.0	1.9
Jogging (treadmill)	32.4	27.6	39.0	1.0
Squash	23.8	31.4	42.9	1.9
Martial arts	9.5	33.3	56.2	1.0
Cricket	46.7	40.0	12.4	1.0
High-impact aerobics	22.9	13.3	60.0	3.8

ATTIVITÀ FISICA ADATTATA: IL RUOLO DELL'ORTOPEDICO

- Individuazione della popolazione ad aumentato rischio di complicanze
- Progettazione dell'intervento
- Scelta dell'impianto
- Considerare il problema!





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The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



AAHKS Symposium

Prevention of Dislocation After Total Hip Arthroplasty

Fiachra E. Rowan, MD, FRCS(Orth), Biju Benjamin, MBBS,
Jurek R. Pietrak, MB BCh, FC Orth(SA), Fares S. Haddad, BSc, MD(Res), FRCS(Orth) *

Department of Trauma and Orthopaedic Surgery, University College London Hospital, London, United Kingdom

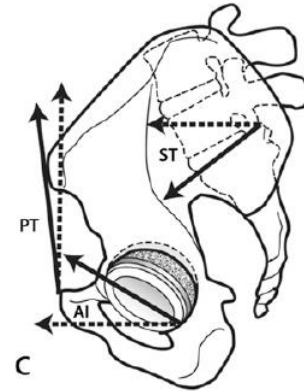
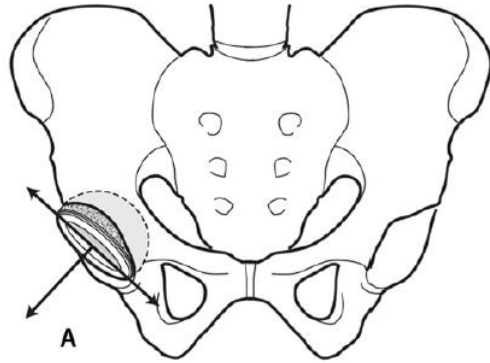
Factors Influencing Instability and Interventions to Reduce Dislocation.

Factor	Intervention
Low-volume surgeon	Refer high-risk patients
Age <50 and >70	Elevated liner
	Dual-mobility liner ^a
Obesity	Dual-mobility liner
	Constrained liner
Neurological conditions	Dual-mobility liner
	Constrained liner
Spinopelvic pathology	Spinal surgery before THA
	Navigation or robotic-assisted implant positioning
	Increase acetabular anteversion
	Dual mobility
Posterior approach	Capsular repair
Increased native offset	Lateralized liners and stems
	Resurfacing arthroplasty
Increased native	Femur-first preparation and trial
	Femoral anteversion
Intraoperative impingement	Excise hypertrophied capsule
	Remove osteophytes
	Osteotomize AIIS
Intraoperative instability	Change to elevated liner
	Change to dual-mobility liner

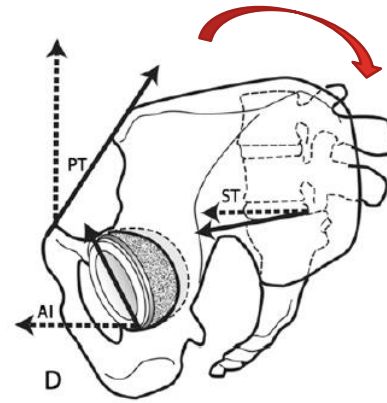
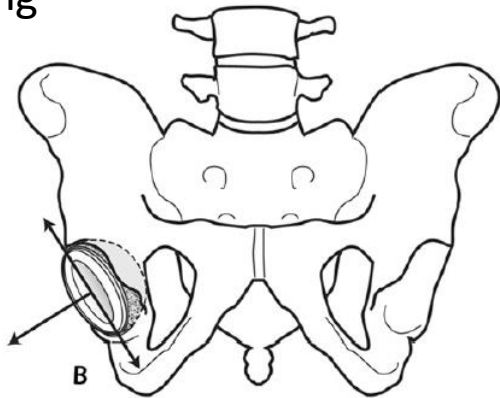
AIIS, anterior inferior iliac spine; THA, total hip arthroplasty.

^a Concern exists regarding taper junctions between cobalt-chromium liners and titanium acetabular shells with modular dual-mobility designs in young people [12].

Standing



Sitting



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Predictability of Acetabular Component Angular Change with Postural Shift from Standing to Sitting Position

Vaibhav Kanawade, MD, Lawrence D. Dorr, MD, and Zhinian Wan, MD

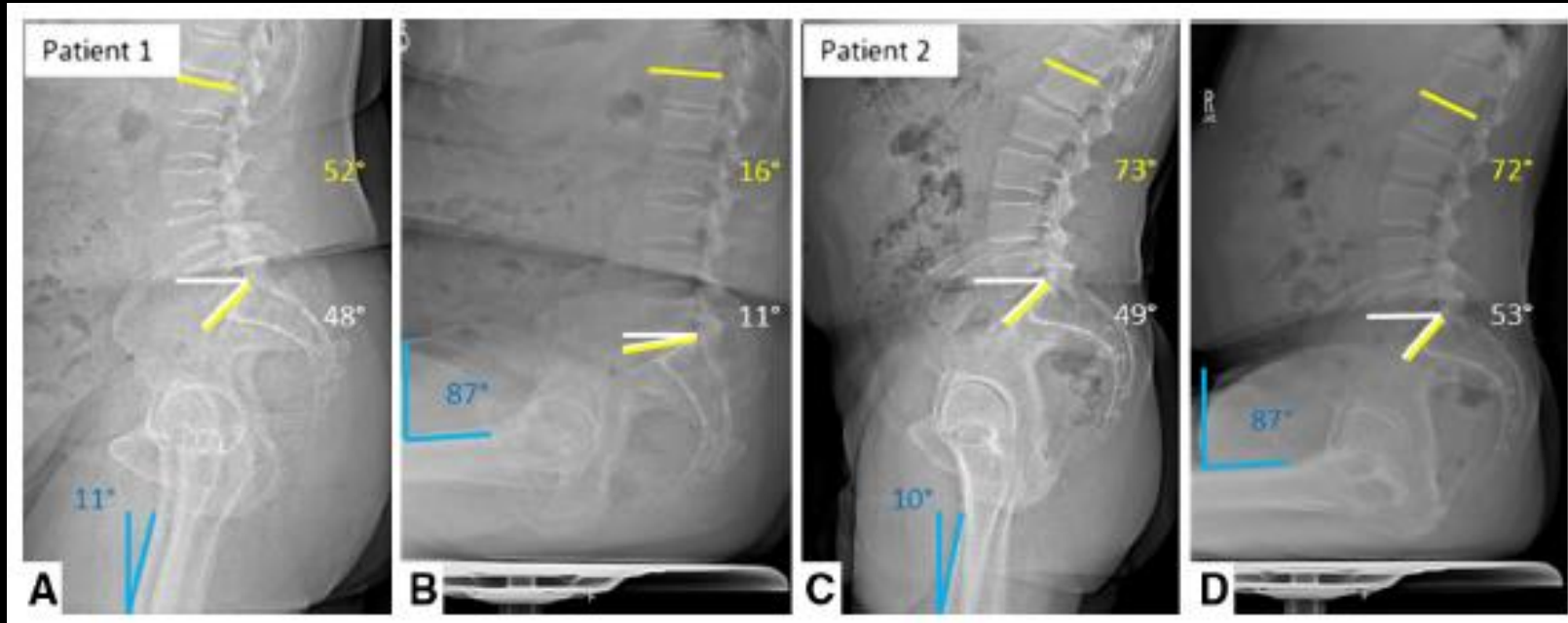
*Investigation performed at the Good Samaritan Hospital and the Orthopedic Department,
Keck Medical Center of USC, Los Angeles, California*

Does Degenerative Lumbar Spine Disease Influence Femoroacetabular Flexion in Patients Undergoing Total Hip Arthroplasty?

Christina I. Esposito PhD, Theodore T. Miller MD, Han Jo Kim MD,
Brian T. Barlow MD, Timothy M. Wright PhD, Douglas E. Padgett MD,
Seth A. Jerabek MD, David J. Mayman MD

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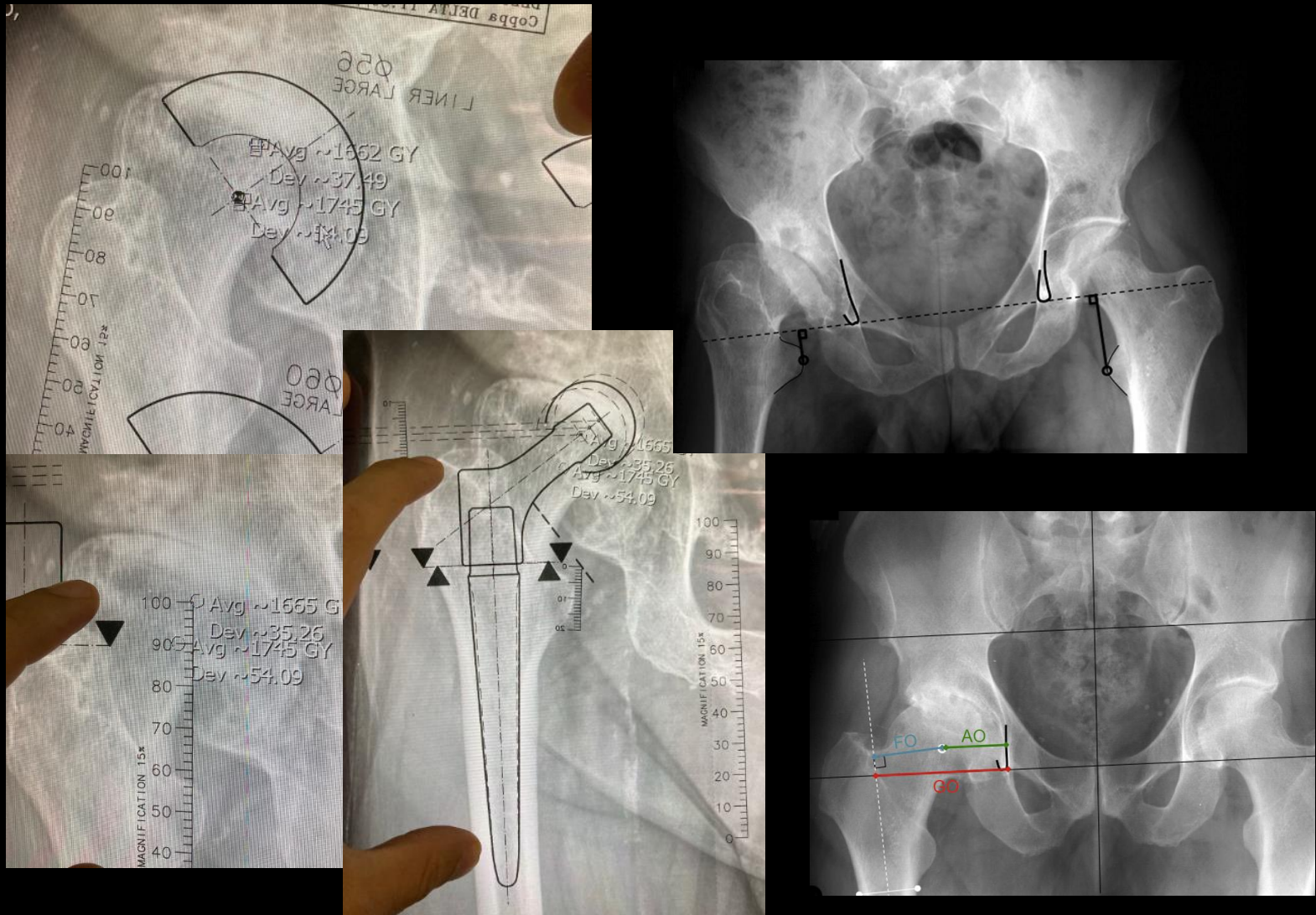
Received: 1 December 2015 / Accepted: 8 March 2016
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- I pazienti con DDD perdono circa 10° di flessione del rachide che recuperano incrementando la flessione dell'anca durante la posizione assisa
- «Flat Back» indicatore di pazienti ad aumentato rischio di lussazione

↓ tilt pelvico posteriore = ↓ antiversione funzionale

PROGETTAZIONE DELL'INTERVENTO: IL PLANNING



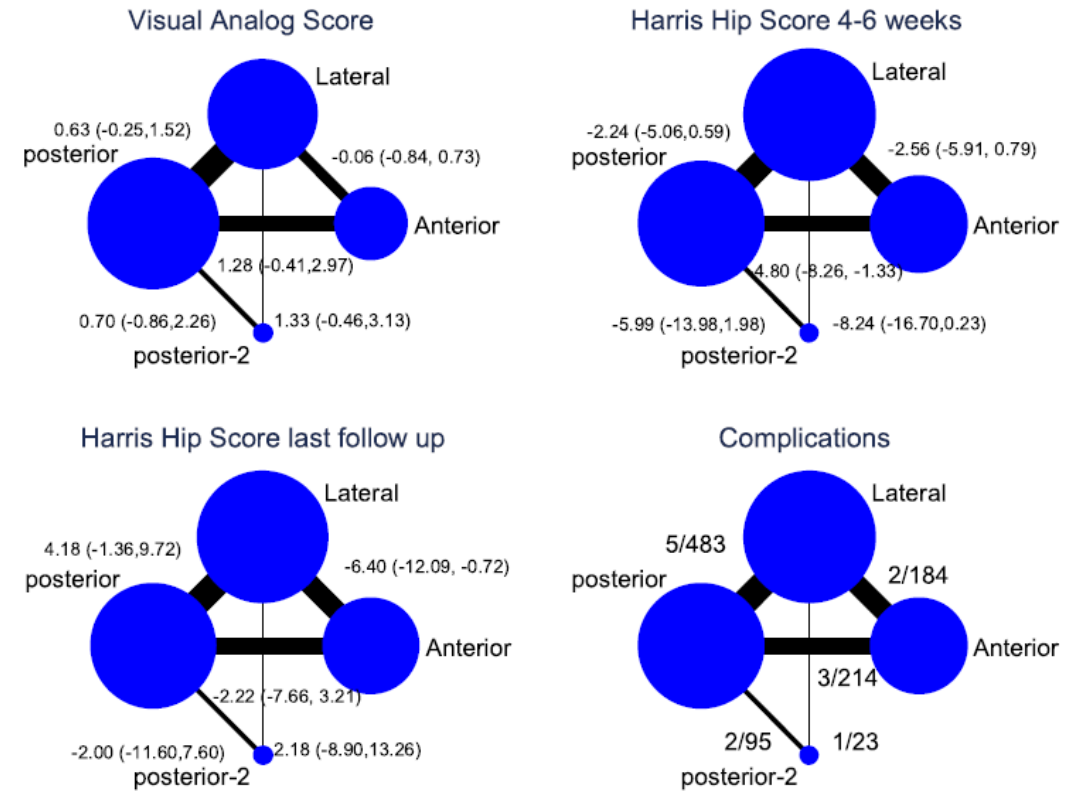
- Ripristino CoR, offset e metria
- Studio anomalie anatomiche
- Scelta e «costruzione» dell'impianto
- *“Prevention of dislocation after THA begins with patient preoperative assessment and planning”*

Comparison of direct anterior, lateral, posterior and posterior-2 approaches in total hip arthroplasty: network meta-analysis

Chinundorn Putananon¹ · Harit Tuchinda² · Alisara Arirachakaran¹ ·
Siwadol Wongsak³ · Thana Narinsorasak⁴ · Jatupon Kongtharvonskul⁵ 

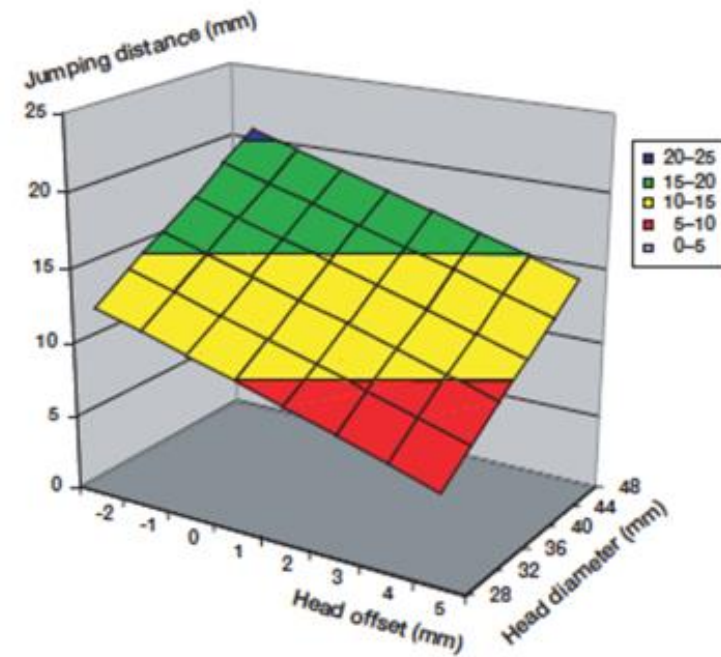
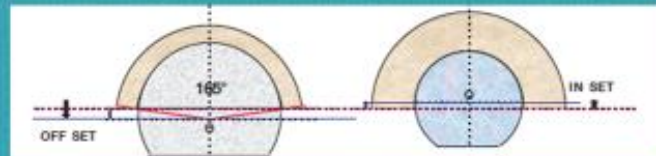
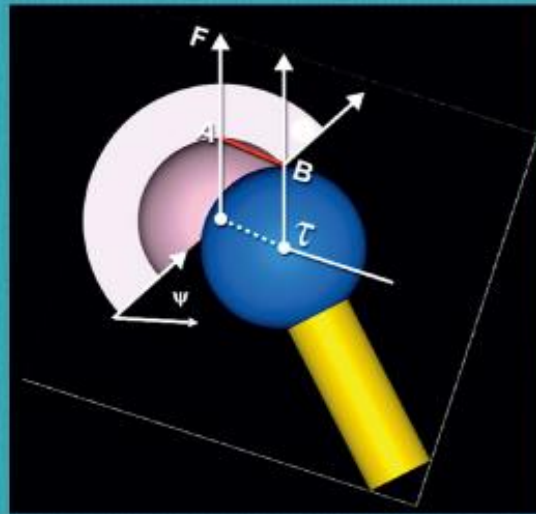
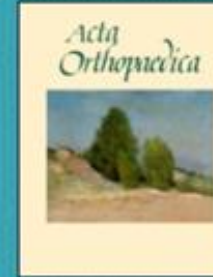
- L'analisi dei registri riporta un aumentato tasso di lussazione per PA, non confermato dal pooling dei dati
- La ricostruzione dei tessuti posteriori riduce le differenze
- Posizionamento cotile più preciso in PA

Accesso laterale miglior compromesso tra stabilità e risultati clinici



Mathematical evaluation of jumping distance in total hip arthroplasty

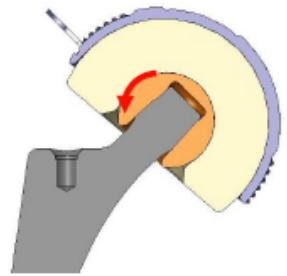
Elhadi Sariali, Jean Yves Lazennec, Frederic Khiami & Yves Catonné



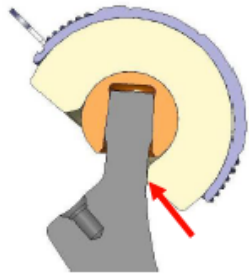
DISEGNO PROTESICO

Sistemi a doppia mobilità

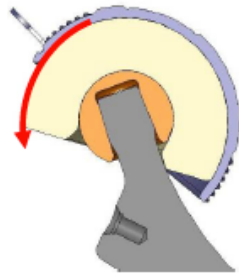
Teste di grande diametro



Low activity level
(walking)
Only small joint in motion

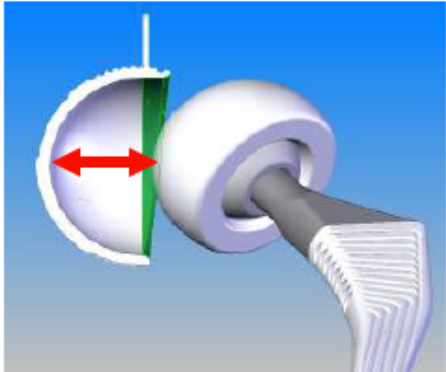


High activity level
(stair climbing)
Impingement with the insert



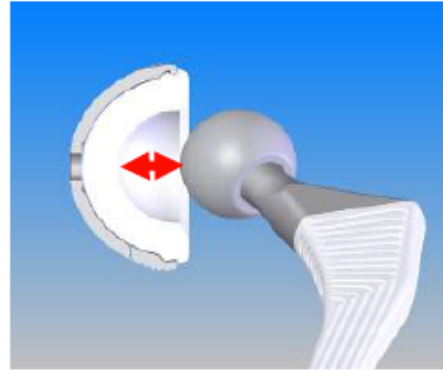
High activity
(standing up)
Large bearing in motion

Necessary distance for
dislocation: **23.5mm !**



Ball Head diameter: **28mm**
Effective Head diameter : **47mm**

Necessary distance for
dislocation: **14mm !**



Ball Head diameter: **28mm**
Effective Head diameter : **28mm**

Turquoise	32 Head	42 Cup
		44 Cup
Beige	36 Head	46 Cup
		48 Cup
Pink	40 Head	50 Cup
		52 Cup
Purple	44 Head	54 Cup
		56 Cup
Dark Brown	48 Head	58 Cup
		60 Cup
		62 Cup
		64 Cup
		66 Cup

S -3.0 mm
M +0 mm
L +4.0 mm
XL +7.0 mm



Adventure sports and sexual freedom hip replacement: the tripolar hip

James W. Pritchett¹



- 160 impianti tra il 1998 e 2011
- F-Up medio 11 anni
- 3 interventi di revisione (mobilizzazione, frattura, infezione)
- Nessun fallimento articolare
- Nessuna limitazione SA nel 99% dei casi

Motion	Preoperative Mean (range)	Postoperative Mean (range)	P value
Flexion	98 (70–130)	126 (110–140)	<.0001
Internal rotation	4 (–10 to 20)	35 (15–60)	<.0001
External rotation	20 (0–35)	40 (25–50)	<.001

Activity	Number of patients
Teaching yoga	12
Teaching pilates	6
Martial arts	10
Teaching paddle board	2
Bungee jumping	2
Surfing	8
Extreme skiing	9
Acrobatics	2
Circus performer	2
Flight jumpers for fire fighting	2
Orthopedic surgeons	6
Other physicians	7
Professional cycling	4
Professional ballet	4
Teaching gymnastics	2
Professional swimming diver	3
Other professional sports (soccer, tennis, golf)	6
Iron man competitor	8
Rodeo performer	3
Firefighter	14

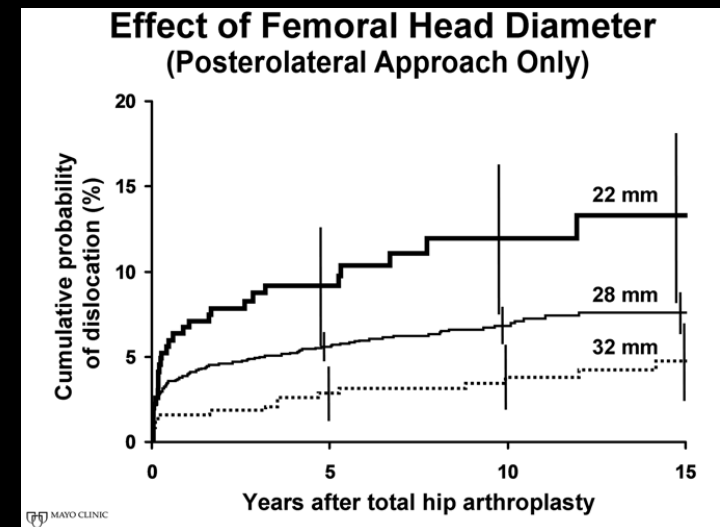
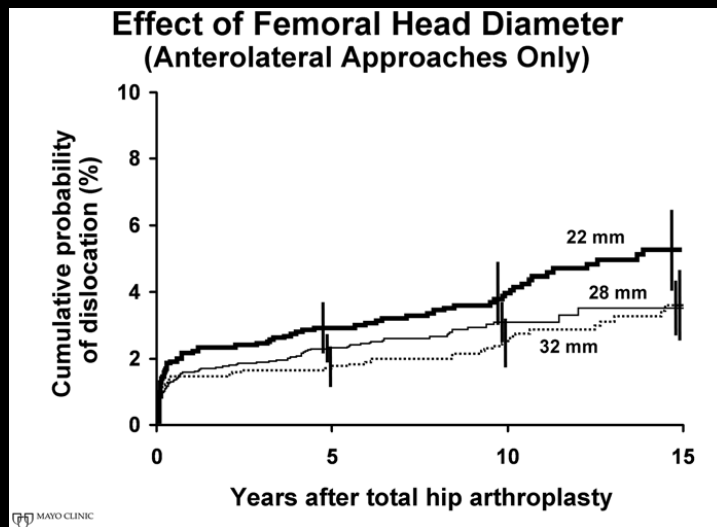
DISEGNO PROTESICO

Teste di Grande Diametro

- Aumento del momento di resistenza alla lussazione del **3,6% per ogni millimetro di incremento** del diametro della testina femorale

Scifert et al, 2001

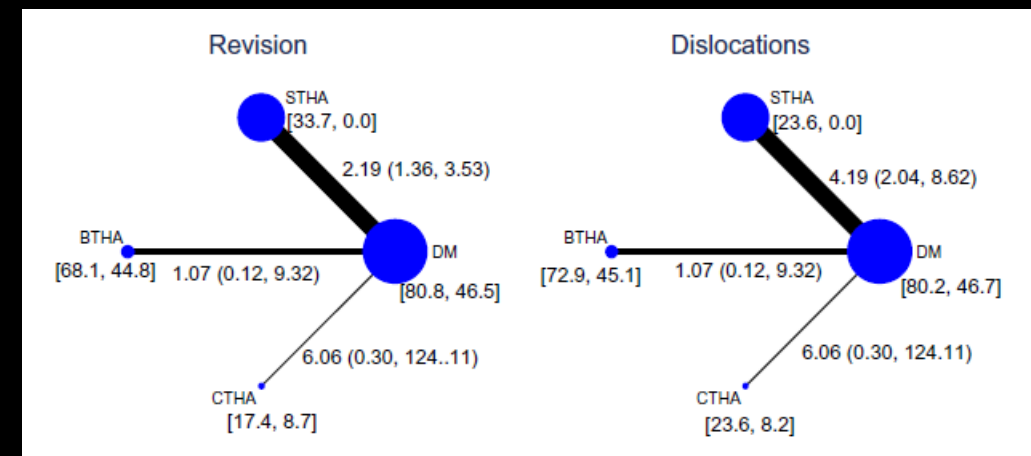
- Notevole riduzione del rischio di lussazione nell'accesso postero - laterale



Berry D, von Knoch M, Schleck C, Harmsen W. Effect of femoral head diameter and operative approach on risk of dislocation after primary total hip arthroplasty. J Bone Joint Surg Am. 2005

Risk of revision and dislocation in single, dual mobility and large femoral head total hip arthroplasty: systematic review and network meta-analysis

Kwanchai Pituckanotai¹ · Alisara Arirachakaran¹ · Harit Tuchinda² ·
Chinundorn Putananon¹ · Nitiphol Nualsalee³ · Kittipong Setrkraising¹ ·
Jatupon Kongtharvonskul⁴ 



- Il rischio di lussazione e di revisione è più basso per DM vs Standard [RR 2.19 (1.36, 3.53) e 4.19 (2.04, 8.62)]
- Seppur con evidenza minore, le protesi con teste di grande diametro appaiono altrettanto vantaggiose rispetto alle standard
- Limitazione: pochi studi a lungo termine

TAKE HOME MESSAGES:

- AFA fondamentale nella promozione della salute, miglioramento risultati e qualità di vita
- L'individuazione delle sottopopolazioni a rischio e la corretta pianificazione dell'intervento permettono un ritorno all'AF sicuro e duraturo
- L'innovazione tecnologica (materiali e design) ha aumentato notevolmente lo spettro di possibilità
- Integrazione multidisciplinare necessaria al raggiungimento del risultato

GRAZIE E...

AD10S!

ADDIO MARADONA



NATAN4ELO