Sports after Total Joint Replacement





Primary Care Conference 7/21-7/25/25 Kauai, HI

Greg Maletis Kaiser Baldwin Park

Disclosures

Primary Care Conference 7/21-7/25/25 Kauai, HI

None to report

Greg Maletis Kaiser Permanente

Projected Increases in US Joint Replacements



2025 1.8 million

2040 3.5 million

Joint Replacements

- Pain relief
- Improve lower extremity function
- Improved healthrelated quality of life
- Increased activity levels



Baby Boomers

- Less tolerant of discomfort and disability
- Do not want to accept limitations of arthritic joints
- Demanding total joint replacement at younger ages
- Higher expectations of returning to athletic activities

Reasons for Knee Replacement

- 80% say pain relief is the main reason for undergoing TKA
- 20% said returning to athletic activities was their primary reason



Knee Replacement TKA



Hip Replacement THA



Hip Resurfacing



Durability is limited

• Polyethelene wear



 Leads to osteolysis and implant loosening



Poly wear is a function of use not time

Periprosthetic Fractures can occur





The implant acts as a stress riser

15 year Implant Survival

Overall

 90% of total knees still in place after 15 yrs

< 60 years

• 82% survival at 15 years

Patients <60 are 30% more active than patients > 60 years of age

Higher rates of mechanical loosening found in more active patients

Exercise after Joint Replacement

Benefits

- Maintain overall health
- Lower BMI
- Increased bone density
 - May improve prosthesis fixation and decrease loosening

Risks

- Higher joint forces lead to implant wear and loosening
- Jogging increases hip joint loads to 500% of body weight.

Do patients return to Sports

- 2085 patients
 - In the 3 yrs prior to surgery 35% participated in sports
 - Swimming, walking, and golf
 - 61% returned to their sports 1-3 years after surgery
 - 26% were unable to return due to pain

 Best predictor is pre-op activity level



Wylde J Bone Joint Surg Br 2008

Limited literature to determine "safe" levels of exercise

- Risk / Benefit
- General health
- Type of activity
- Prior experience
- Intensity
 - Physical fitness
 - Recreation
 - Professional



Patients have higher expectations of returning to higher level sports





Activity Recommendations after Total Hip

Allowed	Allowed with experience	Not recommended
Golf	Skiing	Racquetball/Squash
Swimming	Weight lifting	Singles Tennis
Doubles tennis	Ice skating	Jogging/Running
Stairmaster, elliptical, walking, treadmill	Rollerblading	Contact sports (football, hockey, soccer)
Hiking	Pilates	Handball
Cycling		Basketball
Bowling		Waterskiing
Dancing		High impact aerobics
Rowing		Snowboarding
Weight machines		Martial Arts
		Baseball/Softball

Activity Recommendations after Total Knee

Allowed	Allowed with experience	Not recommended
Golf	Skiing	Racquetball/Squash
Swimming	Doubles Tennis	Singles Tennis
Low impact aerobics	Ice skating	Jogging/Running
Stairmaster, elliptical, walking, treadmill	Cycling	Contact sports (football, hockey, soccer)
Bowling	Hiking	Handball
Dancing	Rowing	Basketball
	Speed walking	Waterskiing
		High impact aerobics
		Snowboarding
		Martial Arts
		Baseball/Softball

TKA Joint Load

- Walking 2.5-2.8 X BW
- Jogging 4.2
- Golf
 - Lead leg 4.4Trail leg 3.0
- Tennis 4.2
- Elliptical 2.3
- Stairmaster 2.4-3.3
- Leg Press 2.8



D'Lima Proc Inst Mech Eng H 226(2) 2012

Activity after THA

- 10 year survival
- <55 years of age</p>
- 88%
- Low impact sports does not appear to increase wear or decrease survival



Activity after Hip resurfacing

- 144 hips at 5 years
- Mean age 52 years
- 90% participating in some type of sports



- Return to sports is better than standard THA
- Concerns about metal on metal wear debris producing ionically charged particles

• 94% survival at 10 years

Ford JBJS 2018

Treacy J Bone Joint Surg Br 2005

Activity after TKA

- Results not quite as good as THA
- 2 articulations
- Shear stress



- 114 knees < 55 yrs
- 8yr follow-up
- 87% survival
 - 60% waked 2 miles/day
 - 25% cycling, tennis, skiing

Diduch J Bone Joint Surg 1997

THA compared to TKA

- 809 patients at 5 years
- More THA patients returned to athletic activities
 - Higher frequency and more hours than TKA
 - THA more active in cycling, hiking, swimming, skiing
- TKA had more pain



High Impact Sports after THA

- 70 high impact sport patients compared to 140 low impact sport participants
- 10 year follow-up
- More wear and higher number of revisions in the high impact group



TKA Results after High Impact sports

- 31 patients with 33 knees
- 3.5 hrs per week
- Sports
 - Jogging, Singles tennis, racquetball, squash, downhill skiing, basketball
- At 4 years f/u 32 of 33 knees had successful clinical and radiographic outcomes



Tennis after THA

- 58 patients with 75 hip replacements
- Returned to nearly the same tennis rating after surgery
- 4% revised at 8 years



Mont Am J Sports Med 2002

Tennis after TKA

- Survey sent to USTA players in Virginia, Delaware, and Maryland
- 33 tennis players with 46 TKA's
- Only 7% had been told by surgeon they could play
- 4% had revision by 7 years



Running after THA

- 608 patients with 804 hip replacements
- 5.4% were joggers preop
- 3.8% returned to jogging post-op
- No loosening or wear noted at 5 years



Running after Hip Resurfacing

- 202 patients with 215 hip resurfacing surgeries
- 92% of runners returned to running
- Time devoted to running 3.1 hrs per week
- Follow-up was only 2 ½ years



Fouilleron AJSM 2012

High Impact Sports after TKA

- Sport group (non recommended sports) matched to a control group
- Non Recommended sports included
 - High impact aerobics
 - Football
 - Soccer
 - Baseball
 - Basketball
 - Jogging
 - Power lifting

- 7.5 years follow-up
- No difference in implant durability
- Better knee scores in sport group
- Control group had a 20% higher revision rate (8.5% vs 11%)

Parratte AAOS 2010 not published

Mt. Everest?



Don Healy 62 years old

Ellen Miller 54 years old Bilateral THA Everest, Nuptse, Lhotse

Surfing after Hip Replacement







Laird Hamilton

Jeff Clark

Surfing after Knee Replacement





Tom Carroll

Total Shoulder Arthroplasty TSA



Sports after TSA

- 89% able to resume sports at a mean 3 yrs after TSA
 - Swimming 20%
 - Golf 16%
 - Cycling 16%
 - Fitness training 16%
- 37% still suffered restrictions due to shoulder



Schumann Am J Sports Med 2010

Reverse Total Shoulder Arthroplasty RSA



Sports after RSA

- 78 patients at 5 yrs
- 23% high-intensity activities
 Hunting, golf, skiing
- 49% moderate-intensity activities
 - Swimming, bowling, raking leaves
- 28% low-intensity activities
 - Walking, stationary bike
- None were able to return to tennis



Barnes Am J Orthopedics 2015

Take away message

- Low to moderate activity should be encouraged <u>— May increase overall total joint survival</u>
- Caution regarding high impact sports
 - Short term results are encouraging
 - Limited long term results
 - 8-10 years may be the critical time to see wear
- New bearing surfaces should improve results
 - Advancements may have unintended consequences

Thank You