

# Biopoly Resurfacing Protocol

## – PHASE 1

### Monitor for evidence of:

- Infection: if patient develops a temperature  $>38^{\circ}$ , refer urgently to the operating surgeon. If the surgeon is unavailable, advise patient to attend A&E to exclude wound infection or septic arthritis
- Distal neurovascular deficit (including DVT)

### Goals:

- **Protect Biopoly site to encourage integration of implant**
- **Control pain and swelling/effusion**
- **Preserve/restore ROM; patient may be placed on a CPM machine**
- **Muscle activation**
- **Normal gait and movement patterns; a brace may be provided if unable to SLR on discharge**

### Weight bearing:

- WBAT using crutches until able to walk without a limp

### Pain, effusion and ROM:

- PEACE* protocol for the management of pain and swelling/effusion  
NB: cryotherapy only influences pain, not drainage
- Terminal extension and full/symmetrical flexion **ASAP**, patella mobilisation if required  
If CPM not used, perform 500 repetitions of flexion/extension ex's three times daily

### Muscle activation and strength:

- SQ's, IRQ, SLR  
If a brace is provided, perform SLR in brace until able to perform without extension lag  
Consider electrostimulation if unable to voluntarily contract quadriceps
- CKC and OKC quadriceps and hamstrings ex's from **4 weeks**
- Concentric and eccentric training of the gluteal and calf muscles
- Add resistance to strengthening ex's as symptoms and signs allow

### Neuromuscular training:

- Proprioceptive ex's (e.g. Bosu balance trainer) from **4 weeks**
- Correct alignment of trunk and lower limb during exercises and gait

### Cycling:

- Static bike with no resistance once sufficient ROM

### Criteria for progressing to Phase 2:

- Closed wound
- No/minimal pain with phase 1 exercises
- No/minimal synovitis/effusion
- Normal patellofemoral mobility, tibiofemoral ROM  $\geq 0-120^{\circ}$
- Voluntary quadriceps contraction
- FWB with normal gait

*PEACE*: Protection, Elevation, Avoid anti-inflammatories, Compression, Elevation

## BIOPOLY RESURFACING PROTOCOL – PHASE 2

### Goals:

- **Protect Biopoly site to encourage integration of implant**
- **Full patellofemoral and tibiofemoral ROM**
- **Increase strength progressively**
- **Increase difficulty of neuromuscular and perturbation training**
- **Maintain good quality movement patterns**
- **Start running and sports specific training dependent on patient's goals**

### Pain, effusion and ROM:

- Monitor for increasing pain, effusion or localised temperature and modify rehabilitation accordingly  
If required, consider NSAIDs or hydrotherapy
- Maintain full extension, patella mobility and regain full/symmetrical flexion

### Strength:

- Double and single leg CKC ex's
- OKC quadriceps and hamstrings ex's
- Add weight/resistance to OKC and CKC ex's as able
- Gluteal and calf muscle strengthening
- Progressively increase resistance and decrease repetitions for all strengthening exercises

### Neuromuscular training:

- Increase difficulty of double leg proprioceptive ex's (e.g. perturbations, two motoric tasks)
- Increase intensity of perturbation, progressing to single leg once able
- Correct alignment of trunk and lower limb during exercises, walking and running.

### Cycling, running and other cardiovascular exercise:

- Add resistance to static bike
- Cyclic exercises (e.g. cross trainer or rower)
- Start running if:
  - full ROM
  - pain  $\leq 2$  VAS and no effusion despite adequate loading
  - limb symmetry index (LSI)  $\geq 70\%$  for quadriceps and hamstrings strength
  - minimum **8 weeks** since surgery
  - clearance given by orthopaedic team
- Increase cardiovascular training (mainly aerobic)
- Introduce backwards and sideways running once competent with forward running
- Introduce multi-plane, sports specific agility movements once competent with linear running

### Criteria for progressing to Phase 3:

- Correct qualitative performance of phase 2 exercise
- LSI  $\geq 80\%$  for quadriceps and hamstrings strength
- LSI  $\geq 80\%$  for hop battery test (e.g. hop for distance, vertical jump, side hop)

## BIOPOLY RESURFACING PROTOCOL – PHASE 3

### Goals:

- Return to physically demanding work or sport, depending on patient's goals

### Strength/power:

- Continue progressive loading for strengthening exercises
- Sports-specific progressions e.g. power development, jumping/landing

### Neuromuscular training:

- Increase difficulty of neuromuscular and perturbation training (e.g. single leg jumping)
- Introduce reactive/unanticipated movements
- Emphasise sports specific movements based on patient's goals
- Maintain quality of movement/performance during strength and sports exercises

### Sports-specific training:

- Increase intensity of agility training (e.g. cutting, pivoting)
- Build sports specific load regarding energy expenditure (aerobic, anaerobic)
- Build sports specific load regarding surface (grass, court etc.)
- Restart training with patient's team

### Criteria for returning to play:

- No knee pain with sports specific activities
- No giving way or fear of giving way during sports-specific activities
- Active dynamic gait pattern and symmetrical running pattern
- Correct quality of performance with all sports-specific activities
- Limb symmetry index (LSI) >90% for quads and hamstrings strength
- LSI >90% for hop battery tests
- Patient psychologically ready/confident to return to sports
- Patient cleared to return to play by orthopaedic team

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