**Evidence** (reference, and web link where available, to the most recent relevant systematic review identified by the PSP, plus a maximum of 2 other systematic reviews, including protocols for future systematic reviews, that the PSP considers relevant.)

- **PICO formatted indicative uncertainty** (if there are multiple sources, a PSP may wish to show them e.g. 1 patient, 19 clinicals, 4 research recommendations). Code: Total no. of individuals asking this question. (No of indivduals asking this question: Physio - Physiotherapist, OS (Orthopaedic surgeon), P (parent), PT (patient), AMP (Advanced Nurse practitioner).

**Original uncertainty** - Physio - Physiotherapist, OS (Orthopaedic surgeon), P (parent), PT (patient), AMP (Advanced Nurse practitioner).

**Source of Uncertainty**

**Can surgery be prevented by combined optimum physiotherapy and orthotic interventions as per the Bangor (Wales) CDD model that has been operating for more than 20 years, with combined clinic between highly trained paed physiotherapists & specialist paediatric orthopaedic consultants and the Pa & therapists, gold standard orthotic provision and all children able to access on a regular basis, from 1- adulthood, cheap and efficient Video Vector gait analysis by the Pa, in separate walking, optimal orthotic designs and alignments, using published clinical algorithms by Owen E, and physiotherapy programmes. The orthopaedic consultants who attend the clinic over 30 years have said that the children is the area covered by the CDD, is Bangor & have minor surgery that in other areas of UK, National awards have recently been won by this team including a Recognising Achievement Award by Welsh government and an MBE. (physio)**

**What surveillance is effective in preventing deformity requiring surgery in CP?**

- **Botox**

**What is the success rate of carrying out an operation in bunion, splints, casts? (pt)**


In the alternative surgery more likely to work? (pt)

Botulinum toxin - long term effects of repeated injecting for adults who received injections in childhood. (physio)

To try and prevent surgery should all children with complex conditions eg CP and LK have access to specialist tertiary centres where all the professionals are trained to a high postgraduate level of knowledge and experience. At the moment it seems they are seen by local staff who are not always trained to a high enough level with poor coordination amongst the team of professionals. The model of a number of centres of excellence in UK where the professionals in that team work well with the local team to form the wider Team Around The Child to ensure that all orthoses and accompanying physiotherapy programmes are optimum for the child at all ages. This happens with other rare paediatric conditions like Cystic Fibrosis, why does it not happen with CP and no to provide preventative interventions. The recommended deficits of the NHS England Churchill report 2015 on Orthotic Provision hasn’t been implemented well enough through UK so CSH has identified this maybe because there are too many organisations and also because local orthoses is low priority to many of them. If there were specialist centres then they would be included to Implement and set high standards. The Churchill report states how much NHS can be saved if there were better services. It also states all the reports and recommendations that have gone before: and how little has changed. So is there the question...... can this only change if there are specialist centres. (physio)

Could surgery be prevented if all physiotherapists and orthotists working with children, especially those with complex disabling conditions like CP, LK, are trained to a higher level in understanding standing and walking, orthotic and physiotherapy management. Currently knowledge of standing and walking and orthotic biomechanics is at a low level. I know this as for 20 years I have taught a post grad course on these subjects both in the UK and internationally and also in train undergraduates. Knowledge levels in CP is shockingly low. Also not all orthopaedic surgeons understand typical and abnormal patterns of walking to the depth they need in complex conditions. So this leads to my next question about specialist centres for complex conditions. (physio)

What orthotic is best for hip abduction in ambulatory children? (nurse)

Research on the benefits of strength training for children with cerebral palsy. And the impact that this has on the development of contracture and need for orthopaedic surgery to correct them. Also looking at the impact of spasticity on this. (pt)

In serial casting more successful than surgery? (pt)

What is serial casting most successful in terms of age of child? (pt)

What % of surgery goes wrong? (pt)

How successful in serial casting? (pt)

In R’s case, what % of foot positions stay in corrected place (pt)

How can you maintain muscle & avoid muscle wastage? (pt)

What can be done in preparation to promote a quick recovery? (pt)


Should both hips be treated simultaneously?


When are the clear indications for lower limb surgery? On various levels and expected outcomes following the surgery (physio)

The best way to treat children with cerebral palsy and dislocated hips? (os)

What is the best management for hip displacement in cerebral palsy (os)


What is the frequency of pain in treated and untreated individuals?


What is the role of early vs late soft tissue, growth intervention? (physio)


What is the true incidence of pain in Cerebral Palsy Hip dislocation? (os)


When should coxa valga be treated surgically? (physio)


Which CP patients with GMFCS 4-5 benefit from early posas/adductor tenotomy. The timing of hip reconstruction in children with cerebral palsy (os)


In which hips and what type of surgery should children with cerebral palsy with hip displacement receive? (os)


Which cohort of children with Cerebral Palsy should have hip reconstruction surgery, and when? (os)


What is the best time for hip reconstruction surgery? (os)


What is the frequency of pain in treated and untreated individuals? (os)


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What is the best treatment for hip migration in cerebral palsy? What is the best treatment for hip migration in Down's syndrome? (os)

The success rate of hip arthrodesis in children with CP presenting with high or fluctuating tone and the effects on QoL and long term positioning. (physio)

Should proximal femoral surgery on bilateral neuromuscular disease(s)?

When should we surgically intervene and which operation (soft tissue or bony) has better outcomes in order to prevent hip migration in children with cerebral palsy? (os)

In children with CP and unilateral hip subluxation and early windup, what should be the absolute indications be for bilateral synchronous varus osteotomies? (os)

Hip correction surgery e.g. osteotomies are so invasive and take too much time for the complex child to recover. Is there an alternative? (physio)

Are the long term benefits and implications with the rotational osteotomies of the femur? (physio)

Are surgical costs or reimbursements cost effective for short and long term outcome following bilateral hip varus osteotomies vs. pelvic osteotomies for Children with CP hip reconstruction? (os)

Do children undergoing hip surgery require immobilisation in hip spica post operatively and how does it affect outcome and post operative comfort levels? (physio)

When does surgery produce better patient centred outcomes than the natural history in hip displacement associated with immobility? (os)

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MULTILEVEL SURGERY


EQUINUS


GAIT ANALYSIS

CP.1C.1

ambulant CP?

Does gait analysis alter surgical decision making in orthopaedic surgery in ambulant CP?

What is the best timing and technique in undertaking lower limb surgery in cerebral palsy and neurodisability (os)

What are the clear indication for lower limb surgery, on various levels and expected sustained into adulthood and for how long? (os)

Cerebral palsy - are functional gains after multilevel surgery in children to improve gait (other: clinical scientist)

What are the key ages for multi level surgery to be carried out for those children with CP, who are likely to need further surgery due to growth spurts. (physio)

Knee: Treatment of extensor mechanism malalignment (subluxation) (os)

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effect of multilevel surgery on quality of life compared to therapy +/- botox (os)

In cerebral palsy surgery, how does SDR affect strength into adulthood? (os)

Single Event Multi-level surgery in ambulant children with CP: Is there a difference between parental and patient satisfaction post-operatively? (physio)

Single Event Multi-level surgery in ambulant children with CP: We assume that satifaction post surgery is linked to function, is this true for parents and for patients? (physio)

How soon should we mobilise kids after multilevel hip surgery in CP? (physio)

Soft tissue surgery timing in cp patients (os)

How do we manage hips after multilevel surgery - do they need a spica? (Physio)

How long will my child benefit from SDR? (pt)

What are the long term benefits of SDR in terms of quality of life? (os)

How useful and widely used are standing frames following multilevel surgery? (physio)

Complications / length of stay for complex needs children having multilevel surgery (physio)

Questions about optimal surgery types, times and rehab for children needing lower limb surgery because of neurological problems including Cerebral Palsy (physio)

Gastroc lengthening - long term implications - operative versus non operative outcome? (physio)

Is it most successful way to lengthen a hamstring in cerebral palsy (os)?

When does hamstring surgery produce better patient-centred outcomes than physiotherapy and lifestyle modification alone in ambulant children with bilateral cerebral palsy (os)?

Has hamstring release been stopped in some hospitals with results being negative? (p)

Surgical management of knee flexion contractures in children with Cerebral palsy (physio)

Is optimal management of equinus ankle - muscle lengthening, tendon lengthening ... (os)

FRC's surgery versus Physio 77 (p)

Comparisons between soft tissue surgery and splints/orthotics (os)

Are there any studies of long term outcomes after FRC's, 2 years, 5 years, 10yrs? What are the results? How do these compare to standard tendon lengthening procedures? (os)

Is FRC's performed on the Nhs in the uk? (p)

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What is the most useful and widely used approach to lengthen a hamstring in cerebral palsy (os)?

Does psoas lengthening help fixed flexion deformity in cerebral palsy (os)?

Is there a 'theory' or calculation when dividing a tendon in the foot and swinging a portion over or is it left to each consultant to make the judgement. (p)

Is it more detrimental to leave an equinus contracture until the age of 7+ to reduce risk of recurrence or treat early to allow more normal function, with the risk of recurrence? (physio)

Research on different techniques for correcting contractures and impact on muscle strength. (p)

Timing of angular correction (os)

Recurrence rates following deformity correction (pediatric surgeons)

Treatment for post operative immobilization in cast post soft tissue lengthening effects outcome in children with cerebral palsy (physio)

Long term outcomes from multilevel or single level surgery for children with Cerebral palsy eg functional, pain, spasticity, range of movement (physio)

Can we use spools to protect flexors when performing lengthening? (os)

Can we have a set of agreed gait/functio nal outcome measures, which are standardised nationally? (os)

Should a gait analysis be done before any orthopaedic surgery? (os)

Has there been more emphasis on pre-hab (pre operative rehab) to secure the most successful outcome in surgery? Is there a ‘right time’ for orthopaedic surgery for children listed for/ having undergone SDR (selective dorsal rhizotomy) surgery? (physio)

Role for SDR and multilevel surgery in optimising function during growth (os)

SDR - benefits for use in GMFCS 1, 2, 3, and for hemiplegic currently mostly used only for levels 2 and 3 (physio)

In children with a SDR protocol how can we use one surgery to do his own thing and not observe the recommendations even when this has resulted in re admissions, no physio therapists and infections? (p)

What is the short term and long term clinical cost effectiveness of SDR in ambulant CP

Should there be more emphasis on pre-hab (pre operative rehab) to secure the most successful outcome in surgery? Is there a ‘right time’ for orthopaedic surgery for children listed for/ having undergone SDR (selective dorsal rhizotomy) surgery? (physio)


What is the aetiology of DDH?

What are the indications for bracing?

What is the best screening for DDH in terms of clinical cost effectiveness?

What is the best treatment when bracing fails?

What causes hip dysplasia? (pt)

Is hypermobility linked to hip dysplasia? (p)

What is the best screening for DDH - Pavlik harness or ultrasound?

Can we scan all babies with hip dysplasia to avoid the need for surgery in the future? (p)

What is the most effective surgeon and centre experience on the outcome of orthopaedic lower limb surgery in children with cerebral palsy?

How can the detection of hip dysplasia in infants be improved to reduce the need for invasive surgery later on? (p)

Why was hip dysplasia not identified sooner? (p)

Reasons for late presentations in DDH (os)

What are the long term benefits of best deformity correction in hip spasticity? What are the potential negative effects? (p)

What is the best treatment when hip dysplasia is diagnosed?

Should we be using "standardised" ultrasound assessment tools for conditions such as developmental dysplasia of the hip in newborn infants? Clinical-Based Child Health. 2010; 8:1: 11–54

Could routine ultrasound babies help reduce undetected DDH? (p)

Are we now overtreating neonates with DDH by using Graf criteria (os)

What causes hip dysplasia? (pt)

The natural history of hip dysplasia and which operative interventions influence it? (os)

Rationale for late presentations in DDH (os)

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The natural history of hip dysplasia and which operative interventions influence it? (os)
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<thead>
<tr>
<th><strong>DDH.1C.4</strong></th>
<th>Should dysplasia be treated in neonates?</th>
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<tr>
<td>Should a Pavlik harness be the best option for DDH? [os]</td>
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<td>Success of a Pavlik harness in Graf subgroups - III, IV. Is there a case for early surgical treatment? Lower threshold for surgery in these subgroups? [Physio]</td>
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<td>Does the Pavlik harness have a significant impact on reducing the need for surgical intervention in severe (Grade 4) DDH and does age of diagnosis have an impact on this outcome? [p]</td>
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<td>What is the optimal/prolonged duration of Pavlik harness treatment for effective treatment of DDH? [ANP]</td>
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<td>Could surgery be an option before 6 months of age to gain better outcomes? [p]</td>
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<td>Is there any indication for early closed reduction of Graf IV hips under the age of 6 months of age? [Physio]</td>
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<td>DDH.1D</td>
<td>What is the best treatment for late presenting DDH in terms of timing, surgical method, complications and outcomes?</td>
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<td>Do we have to wait for the capital epiphysis to be present to reduce the risk of AVN in infants who present with a delayed diagnosis of DDH? [os]</td>
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<td>Outcome of treatment in late presentations of DDH - versus treatment of early presentations of DDH (3 months) [os]</td>
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<td>At what stage does research show that late diagnosis leads to difficulties in correcting DDH? [p]</td>
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<td>Does there exist evidence of an following DDH treatment match clinical signs/symptoms? [os]</td>
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<td>In severe DDH is there any point for the operation as a baby given a second operation is needed? [p]</td>
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<td>Timing of surgical intervention in DDH - immediate vs delay for osseous nucleus or other amen [os]</td>
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<td>DDH - optimal surgical strategies? [os]</td>
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<td>Does the best surgical route for treatment of congenitally dislocated hip (medial vs anterior)? [os]</td>
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<td>Dislocated hip age 6-18 months, closed or open reduction is superior? [os]</td>
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<td>Does closed reduction of dysplastic hips really work? [os]</td>
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<td>Is there always value in attempting closed reductions (is reduced under GA, which has its own risks) before resorting to an open reduction - a plan which puts a child through GA twice? [p]</td>
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<td>Is open/closed reduction in babies always the best option for severe DDH or is surgical intervention left until an osteotomy can be performed? (os) Is the best age to perform this procedure? [p]</td>
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<td>DDH treatment: closed vs open reduction in children age 12 months? [os] Is medial open reduction ratio? [os]</td>
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<td>Early HROR versus delay open reduction. AVN, radiological and hip function scores Secondary surgery rates. [os]</td>
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<td>Does pre-operative traction increase hip and improve outcome for paediatric hip dislocation? [os]</td>
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<td>Traction versus surgery fixation, which gives better orthopaedic results (bones rather than finesses) [nurse]</td>
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<td>Short and long term outcomes of closed reduction, open reduction and open reduction with osteotomy for DDH [os]</td>
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<td>Is femoral antversion really important in the treatment of DDH under the age of 2 years? [os]</td>
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<td>Do we require to remove the pins from the leg after the DDH operation or can they be left in? What are the pros and cons? [p]</td>
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<td>The use of lateral osteotomy for hip dysplasia and further surgery in adulthood? [os] Are there ways of avoiding the nerve during surgery to stop numbness (long term) Is the goal following the hip osteotomy? [p]</td>
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<td>Up to what age can arthrography and closed reduction of hip be used without needing to do a pelvic osteotomy? [os]</td>
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<td>Does the frequency of femoral pin-osteotomies over time affect other areas of development, particularly for children under 5. Does the cumulative effect of surgery through time become achieved in adulthood via replacement? [p] Ways of minimizing risk of osteonecrosis following surgery for DDH. Predictors and time limits for arthroplasty reimplantation in DDH [os]</td>
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<td>How best to avoid avascular necrosis in management of hip dysplasia? Awareness amongst surgeons of congenital hip instability preventing as bilateral dysplasia hips? [os] Developmental hip dysplasia and complications such AVN [p]</td>
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<td>Passive treatment of AVN (any sight) [os] Will my child have normal range of movement in their leg and hip after the DDH operation? [p] Success rate of Union hip reductions in babies of 12 months [nurse]</td>
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<td>Success rate of 'closed' hip reductions in babies over 12 months [nurse]</td>
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<td>DDH.1E</td>
<td>What are the long-term outcomes of treatment? What are the effects of multiple operations?</td>
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<td>Success rate of surgery for congenital dislocation of the hip [pp]</td>
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<td>Is medial/open reductions on the hip be abandoned, in favour of an anterior open reduction? [os]</td>
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Would there be a way of optimizing the surgical procedure or post-operative period to reduce the need for children with DDH from undergoing multiple pelvic procedures?

Long term evidence for what surgery benefits perthes and DDH.

Long term results, multicenter, prospective data in CTEV, DDH surgery (including surgical outcomes).

How successful will the operation be for DDH and will my baby require another operation?

Is there any research to see patterns in how an osteotomy can affect a person later in life?

DDH - what is the definition of a concentric reduction. 1 v 3 v 5 mm medial dye pooling correlated to subsequent outcomes.

What should one do for residual acetabular dysplasia in children and when?

Long term outcomes into adulthood following surgery for DDH (NURSE/Physio)

Outcome at age 18, 35 and 50 following open reduction in a THR (Physio)

Long term outcomes of DDH with endpoint of THR (including number of surgeries etc.)

The long term outcome of children who have been treated for DDH (i.e. the risk of developing osteoarthritis in adulthood by Severin Classification).

Is there an age when it becomes difficult to correct without a hip replacement?

Does performing a pelvic osteotomy for persistent dysplasia in DDH delay THR in adulthood?

How long will the hip itself osteotomy reduce the likelihood of a hip replacement?

What are the alternatives to the osteotomy procedure?

What is the role of the pre-operative traction. What is the post-op care in DDH treatment.

Could we look at introducing traction again for babies with DDH, to see if the outcomes are different to the babies who need multiple surgeries to get the hip/s stabilized. Can we predict those to whom traction may be of benefit?

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What is the role of a hip spica cast in mobilizing joint to allow best results after surgery?
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<td>What causes Perthes' disease?</td>
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<td>Why does Perthes disease happen?</td>
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<td>What causes Perthes disease? When should surgical intervention be used and when not?</td>
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<td>What causes Perthes disease? Impact on mobility in later life</td>
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<td>Perthes surgery</td>
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<td>Research into Perthes and why it occurs</td>
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<td>Does Perthes affect certain age groups and genders?</td>
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<td>How does Perthes affect everybody differently, why and mainly from?</td>
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<td>Perthes surgery improves days more than girls, however, only how girls affected in our</td>
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<td>Causes and best treatment for Perthes (to include)</td>
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<td>Where does LCPD come from, what's the cause, reason, etc…</td>
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What are the differences for a Perthes patient in risky, painful, invasive surgery leading to months of immobility in recovery, vs horse riding which is severely beneficial to the condition, but has a host of other positive outcomes? (p)

Use of bisphosphonates in Perthes: oral, IV, intravenous. (os)

Does vitamin D deficiency affect the outcome of Perthes prognosis, either following a watch and wait pathway or surgery? (charity)

Will giving my child calcium and vitamin D supplements help? (P)

Best surgical operation for perthes (eg VDRO vs shelf) (os)

What is the ideal surgical management of Perthes disease? (OS)

What is the most successful treatment for Perthes disease? (p)

What role does vitamin D deficiency play in Perthes disease? (charity)

What is the best intervention for Perthes disease and should a treatment plan involve multiple surgeries or aim for a single surgery? (pt)

What is the most effective operation for treating Perthes Disease? (p)

What is the best operation for late onset Perthes Disease in girls over 12 years old? (p)

What are the benefits of surgical intervention for Perthes disease, and to what extent does this vary by age? (p)

Use of surgery in Perthes (os)

Is my child crippled for life? (many think this after reading blogs) (p)

What is the ideal surgical management of Perthes disease? (?DVRO, ?pelvic osteotomy, ?how to treat hinged abduction) (os)

In which patients and what type of surgery is best for Perthes disease? (os)

How can we identify patients with Perthes' disease likely to benefit from surgical intervention? (os)

What is the ideal surgical treatment for Perthes disease? (os)

What is the most successful surgical operation for Perthes disease? (p)

What is the best surgical option for Perthes disease? (os)

What is the best surgical option for Perthes disease in girls over 12 years old? (p)

Will giving my child calcium and vitamin D supplements help? (P)

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What are the benefits of surgical intervention for Perthes disease, and to what extent does this vary by age? (p)

Use of surgery in Perthes (os)

Is my child crippled for life? (many think this after reading blogs) (p)

How long does Perthes last? (p)

What new operations can help Perthes Disease (P)

Which patients should have operative intervention for Perthes disease? (OS)

Perthes: when to operate and which to do? (OS)

Perthes disease, when to operate (os)

When is surgery appropriate for Perthes and what is the best operation? (os)

An early surgical treatment the best option for PERTHES disease in children? (pt)

Perthes' condition - at what stage does surgery give optimal results in the long term? to preserve the hip joint? (os)

Perthes disease: Does having an operation make it easier to live with perthess? (p)

What hip shapes have the worse prognosis in Perthes' disease - and can it be used to predict this before? (os)

What is the relative value of operations in Perthes? (p)

Will my child get arthritis in all of his/her joints? (p)

Why does the hip click when he walks (p)

Can you prevent hip replacements following Perthes Disease? (p)

Can this prevention include less intrusive surgical procedures? (p)

Is there a way that the femoral head can be stabilised to prevent further deterioration in Perthe's disease. (p)
SSFE.1A What is the optimal surgical treatment and timing for unstable SSFE?

- Initial operative management of severe SSFE - already in progress (OS)
- What is the best surgical procedure to contain femoral head in Perthes Disease: Shelf or Femoral Venous osteotomy? (paediatrician)
- Perthes' condition: what is the most desirable operation to ensure lifelong function of the hip: femoral osteotomy, pelvic osteotomy or a combination of both? (OS)
- How is leg length difference best treated? (OS)
- Does correcting limb lengthening discrepancy improve patient outcomes? (OS)
- Should leg length differences in children with Perthes be corrected earlier to reduce pain and dissipation? (GP)
- What is my child has a leg length discrepancy will it sort itself out, do we need to have a further surgery, or should our child go through leg lengthening surgery or have the growth plates on the good leg closed? (GP)

SSFE.1B What is the best setting for management of SSFE?

- Comparative outcome between conservative and surgical treatment for SSFE (physio)
- Trial of PWB technique for acure SSFE (OS)
- Severe slipped upper femoral epiphysis. Open reduction or in situ pinning (OS)
- SCFE reduce or pin in situ (OS)
- Are sealing screws and reduction in situ (OS)
- Role: growing pin threaded screw (OS)
- GTP (in situ) (GP)
- Do we need to do CT scan to assess the severity of SSFE helping us to decide weather to fix in situ or to reduce the slip with osteotomy? (paediatrician)
- How should we treat unstable SSFE to optimise hip function throughout life course? (GP)

SSFE.1C Should we remove metal work from children routinely?

- What is the best treatment for severe unstable SSFE to surgical dislocation via percutaneous pin osteotomy any better or worse than open reduction? (OS)
- Deloped diagnosis of slipped upper femoral epiphysis and prognosis following surgery (GP)
- Hip dislocation and capital realignment in SSFE. Long term outcome Short term AVN rate (GP)
- Outcome of hip dislocation surgery for SSFE in long term does it reduce long term risk of degenerative arthritis? (OS)
- Outcomes following surgery versus non surgery for severe slipped upper femoral epiphysis (OS)
- Should the non-affected hip undergo fixation in SSFE (Slipped Upper Femoral Epiphysis)? (OS)
- Should we use metal work from children routinely? (GP)

SSFE.1D Hip dislocation and capital realignment in SSFE. Long term outcome Short term AVN rate

- What is the impact of AVN on patients with severe SSFE undergoing selection surgery? (GP)
- Does correcting limb lengthening discrepancy improve patient outcomes? (OS)
- How should we treat unstable SSFE to optimise hip function throughout life course? (GP)
- GTP: contralateral hip fixation or not? (GP)

SSFE.1E what are the best settings for management of SSFE?

- Should all moderate and severe SSFE be transferred to a specialised centre for open reduction, subcapital osteotomy and fixation? (GP)
- SCFE reduce or pin in situ (OS)
- Are sealing screws and reduction in situ (OS)
- Role: growing pin threaded screw (OS)
- GTP (in situ) (GP)
- Do we need to do CT scan to assess the severity of SSFE helping us to decide weather to fix in situ or to reduce the slip with osteotomy? (paediatrician)
- How should we treat unstable SSFE to optimise hip function throughout life course? (GP)

SSFE.1F Do children need to be on crutches/partial weight bearing to reduce the risk of fracture after removal of metalwork in the legs, and if so, for how long? (OS)

SSFE.1G What are the indications for metalwork retrieval in children?

- How often does any metalwork need to be retrieved following surgery and for what reasons (physio)
- Should we remove metal work from children routinely? (GP)
- Do children need to be on crutches/partial weight bearing to reduce the risk of fracture after removal of metalwork in the legs, and if so, for how long? (OS)

SSFE.1H How is leg length difference best treated?

- What is the best surgical procedure to contain femoral head in Perthes Disease: Shelf or Femoral Venous osteotomy? (paediatrician)
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SSFE.1I Does correcting limb lengthening discrepancy improve patient outcomes?

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SSFE.1J Should leg length differences in children with Perthes be corrected earlier to reduce pain and dissipation?

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- What is my child has a leg length discrepancy will it sort itself out, do we need to have a further surgery, or should our child go through leg lengthening surgery or have the growth plates on the good leg closed? (GP)

PP.1A Is DVT prophylaxis required in children and what are the indications?

- What should we do in regard to DVT prophylaxis? (nurse)
- Should we use DVT prophylaxis in lower limbs surgery: children - what and when? (OS)
- Need for thromboprophylaxis (OS)
- Should we remove metal work from children routinely? (GP)

PP.1B What should we do in regard to DVT prophylaxis? (nurse)

- What should we do in regard to DVT prophylaxis? (nurse)
- Should we use DVT prophylaxis in lower limbs surgery: children - what and when? (OS)
- Need for thromboprophylaxis (OS)
- Should we remove metal work from children routinely? (GP)

PP.1C Should we remove metal work from children routinely?

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- Should we use DVT prophylaxis in lower limbs surgery: children - what and when? (OS)
- Need for thromboprophylaxis (OS)
- Should we remove metal work from children routinely? (GP)

PP.1D Need for thromboprophylaxis (OS)

- What should we do in regard to DVT prophylaxis? (nurse)
- Should we use DVT prophylaxis in lower limbs surgery: children - what and when? (OS)
- Need for thromboprophylaxis (OS)
- Should we remove metal work from children routinely? (GP)
What is the most effective treatment for patellofemoral instability? (Physio)

Is there evidence for the use of serial casting in the treatment of idiopathic toe-walking? (Physio)

Does the use of Botulinum Toxin A improve the outcomes of idiopathic toe-walking? (Physio)

What is the best management protocol for congenital tibial pseudoarthrosis? (Physio)

Surgery in patella instability using a soft tissue technique (Physio)

Best surgery for PFJ instability (Physio)

Best surgery for PFJ instability (Physio)

What is the most effective form of treatment for congenital pseudarthrosis of the tibia (Physio)

What is the best way to treat idiopathic toe-walking? (Physio)

What is the best treatment for tarsal coalition? (Physio)

What is the most effective treatment for pes valgus? (Physio)

Does the use of physical therapy improve the outcomes of anterior knee pain? (Physio)

What is the most effective treatment for patellar dislocations? (Physio)

What is the best management protocol for anterior knee pain? (Physio)

Is serial casting effective in the long-term management of idiopathic toe-walkers (Physio)

Does lateral ligament repair in children with chronic lateral ankle instability improve symptoms of pain and instability and prevent development of chronic pain? (Physio)

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What is the most effective form of treatment for congenital pseudarthrosis of the tibia (Physio)

What is the most effective treatment for patellar dislocations (Physio)

What is the best treatment for tarsal coalition? (Physio)

What is the best way to treat idiopathic toe-walking? (Physio)

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Does lateral ligament repair in children with chronic lateral ankle instability improve symptoms of pain and instability and prevent development of chronic pain? (Physio)

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What is the role of casting in metatarsus adductus?

What indicates and must effective treatment for relapsed clubfoot? What is the role of tendon transfer?
All in box above (P)

What factors, other than predicted leg length difference at maturity, affect the choice between lengthening and amputation in cases of fibular hemimelia or PFFD? Is the success rate of different lengthening techniques (the last report was from Dr. Paley 10 years ago) (P)


What is the best management for the extramedullary plating of lower limb fractures? (nurse)

Best cleaning techniques/dressings to use on reconstructive frames. (nurse)

Best evidence-based protocol for cleaning pin sites on a frame. (nurse/clinician nurse specialist)

Aspects of pin site care (nurse educator)


What is the best prevention of phantom limb pain following lower limb amputations?

Revising surgery on amputations are based on what factors? (physical therapist)

When is surgical intervention required? (physician)

How do you decide to operate? (physician)

What is the role of lymphatic drainage? (physician)

What is the effect of lymphatic fluid? (physician)

What are the long term consequences after lymphatic drainage? (physician)

Which is the best way to treat lymphedema? (physician)

Does retrograde drilling (Retrograde or Antegrade) give better outcome? (physician)

What is the best surgical treatment for talar osteochondritis? (physician)

What is the best surgical treatment for osteochondritis of the talus? (physician)

What is the best surgical treatment for osteochondritis of the ankle joint? (physician)

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<thead>
<tr>
<th>G.1.A.1</th>
<th>What is the role of preoperative rehabilitation?</th>
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<tr>
<td>Does vitamin D supplementation or other diet supplements increase recovery rates following bone surgery, such as osteotomy or lengthening? (p)</td>
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<td>Does vitamin D supplementation or other diet supplements increase recovery rates following bone surgery, such as osteotomy or lengthening? (p)</td>
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<td>Is deficient Vitamin D a reason for poor bone healing? (OS)</td>
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<td>G.1.C</td>
<td>What are the best strategies to optimise communication of information to patient and carers to enable shared decision making?</td>
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<tr>
<td>What are the best tools enabling assessment of the cost (in the broad sense) of a surgical or non-surgical intervention during childhood as the benefits both during childhood and through maturity? This question is fundamental to everything Paediatric Orthopaedic Surgeons do, yet these tools are infrequently used in research, and rarely in clinical (surgical or non-surgical) practice. (os)</td>
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<tr>
<td>Effective liaison with community teams (physio)</td>
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<td>What are the best strategies to optimise communication of information to patient and carers to enable shared decision making? (physio)</td>
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<td>How effective will the surgery be? (Grandparent)</td>
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<td>Do hospitals consider the best time for surgery to ensure the best post op results from physiotherapy to regain function? (physio)</td>
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<td>What are the potential long term implications of carrying out that particular type of operation? (physio)</td>
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<td>How much communication is there with community physiotherapists pre and post op? (Physio)</td>
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<td>What is the communication between the community team &amp; the orthopaedic team? (physio)</td>
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<td>How quick does operation details and post op plans get communicated to those involved with post op care in the community? (physio)</td>
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<tr>
<td>How can we communicate better between teams who are not on site or share IT systems to improve outcomes for children? (physio)</td>
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<tr>
<td>How is clinical decision making made? (physio)</td>
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<td>What should be involved in clinical decision making? (physio)</td>
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<tr>
<td>Is there an MDT discussion with more complex surgery? (Grandparents)</td>
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<td>What is the role of pre-operative assessment in orthopaedics - what is needed? (Physio)</td>
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<td>How best to provide service (MHM or multi) (P)</td>
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<td>What are the risks of surgery? (P)</td>
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<td>Is surgery is appropriate for the child? (P)</td>
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<td>How does timing of surgical interventions work with adolescent growth patterns? (P)</td>
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<tr>
<td>When is the timing best for successful outcomes? (PT)</td>
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<td>What speed is intervention best performed (small stages or bigger steps)? (P)</td>
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<tr>
<td>What happens during surgery? (P)</td>
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<td>How long does the operation take? (P)</td>
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<td>How does the operation take place? (P)</td>
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<td>Will the benefit to my child's mobility? (Grandparent)</td>
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<td>What is the average recovery time post surgery? (PT)</td>
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<td>Will the surgery improve my child's mobility? (Grandparent)</td>
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<td>How will the surgery improve my child's mobility? (Grandparent)</td>
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<tr>
<td>When is the optimal time to complete? (Physio)</td>
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<tr>
<td>Is there an optimal age for surgery? (PT)</td>
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<td>What is the best technique and age for surgery? (PT)</td>
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<td>What is the optimal age range for certain procedures? (PT)</td>
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<td>Does optimal age differ depending on specific procedures? (PT)</td>
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<tr>
<td>The optimal age to carry out surgery (PT)</td>
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<tr>
<td>What nutrients can be supplemented to avoid issues, both post and pre surgery, in regard to cognition, depleted glutathione levels, blood flow (during immobilization) and to support mitochondrial function? (PT)</td>
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<td>Are there any child-related factors that are important before considering orthopedic surgery during adolescence? (PT)</td>
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<td>What is the best way of knowing how much a child's gene status prior to these orthopedic surgeries during adolescence. (PT)</td>
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<tr>
<td>MTHFR, to pinpoint more compatible pharmaceuticals, nutrient supplements and nerve support? (PT)</td>
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<tr>
<td>Is there a way that one can increase the child's overall health prior to considering orthopedic surgery during adolescence? (PT)</td>
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<tr>
<td>What evidence is there that this operation works? (P)</td>
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<tr>
<td>How do I know as a parent that this operation is worth doing? (P)</td>
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<tr>
<td>Do the benefits out-way the risks? (P)</td>
<td></td>
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<tr>
<td>Has there been any cases of erythema nodosum in children post lower limb surgery? (P)</td>
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<tr>
<td>Are detailed operations on the feet possible to position the feet better? (P)</td>
<td></td>
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<tr>
<td>If child was not &quot;mobile&quot; would the surgery still be offered and would surgery results be affected? (P)</td>
<td></td>
</tr>
</tbody>
</table>
If different growth paths of lower limbs are positively or negatively influenced by operations? (Pt)

What would help the children prepare for surgery? (OT)

How does surgery affect children psychologically? (OS)

What impact did the surgery have on family dynamics, social and physical impact? (physio)

Expected recovery period? (P)

How long does it take to have a full recovery? (P)

What sort of aftercare will be available for patient and carers after major surgery to lower limbs? (P)

What are the success rates of surgery, optimal post-operative care, the risk/benefit balance, the outcomes to be expected and the potential complications? (P)

Success (P)

How is surgery determined (P)

For actually works (P)

Risks and benefits (GP)

Outcomes of different operations (P)

Clinical Help groups available (P)

Will they need additional operations as they grow? (physio)

If repeat surgery is ever needed, is there a specific age for it to be done? (P)

How do I know how many of these operations surgeons do, and do surgeons who do them have better results? (P)

Muscle and bone strengthening for a child who could walk but can no longer (P)

Outcomes and long term follow up results for procedures done. (OS)

Non-operative results (OS)

Will further surgery be required? (Other: Grandparent)

Are there risks of increasing the disability/mobility post surgery? (Other: Grandparent)

How much variation is set at point of post op instruction/follow up, for standardised surgery methods? (Physio)

What alternative are available should the surgery be unsuccessful? (P)

How long to heal? (P)

What complications would be likely to occur? (P)

How do potential surgical complications, eg scar tissue, infection, affect QoLs compared to other investigation options, including no action? (P)

Can we determine how much/little of any given period orthotics are worn? (like the spinal brace and FAO for CTEV studies) (P)

How much function is improved post op? (physio)

Long term effects of surgical intervention (physio)

How often does surgery need to be repeated (physio)

More about the timeframe of recovery. Why and how do the specific surgeries affect the outcome (P)

Are there any scans or X-rays that can be done as a baby to determine what level of movements they will have when they get older? (P)

What precautions can be taken to reduce the risk of infection following surgery? (P)

What should rehab following surgery include, how long is it expected to last and how does it affect the result of treatment? (P)

What's the best way to recover? (P)

Best practice guidelines for pre and post surgery rehab (Physio)

How easy is it to get social housing changes done if the surgery means our home is no good... doors not big enough, wet rooms needed etc (P)

How long is it going to take for me to heal? (Pt)

For how long can't I go to school? (Pt)

Do I have to use crutches? (Pt)

What can I do to help my child develop muscle growth? (P)

After operation(s), will my child be able to walk soon / ever (P)

Some quantification of the amount of rehab - so this can be properly funded in the community. (physio)

quantification of the type of rehab/ length of expected change in function post operatively (PHYSIO)

Recovery time (P)

Recover time and regaining of strength and mobility (P)

Who responds best? How long does it take to recover? Qualitative and quantitative outcomes. What’s the optimal post operative management? Does physiotherapy improve outcomes? (Physio)

Should greater integration between community and inpatient therapies help optimize recovery in all cases of lower limb surgery? (physio)

How to make rehabilitation most effective post surgery (OS)

Search done. No RCTs or SRs.

G.10

G.1E
When do kids actually return to school and when do parents get back to work... when does life get back to normal after surgery? (os)

Why, when the importance of post-op rehab is well recognised, is it not better funded (physio)

Evidence for post-op immobilisation timeframe (physio)

Benefits of full or partial weight-bearing (physio)

What are the best ways to measure outcome in lower limb orthopaedic surgery in children.

Are there better outcomes if there are species added to diet? (p)

More defined length of recovery times due to procedure performed? (P)

What are standard outcome measure of success best timing of operation to maximise benefits of operation (physio)

Are there adequate validated outcome tools used in children undergoing surgery for the most common conditions? (os)

The risk of the treatment relapsing (p)

Are there likely to be problems in older age? (P)

Success rates (P)

What are the outcomes of surgery in terms of improvement in QoL and function? (p)

What is the difference between capacity to function and actual function? (os)

What is the progression in after each type of surgery (p)

Recovery times (P)

What future problems will occur that will require surgery? (P)

What are the long term effects of the surgery (P)

How do you know surgery is successful? (P)

How will this particular surgery improve the outcome for my child? (P)

How many surgical interventions did the children have over time and what effect did the surgery have on their quality of life (physio)

How a standardised routine pre-op Physiotherapy program decreases LOS/Improve post op outcomes for example range of motion/flexibility/pain/QOL/return to school/pelvic ADL's (physio)

Alternatives to surgery using various orthosis and physio (P)

How much your movement is limited from this operation Whether you can still engage in sexual intercourse and have children (p)
More detailed information to be shown on the JLA website for the questions discussed at the final workshop.

<table>
<thead>
<tr>
<th>PSP unique identifier (to be allocated by JLA team on receipt of final priorities from PSP)</th>
<th>Record ID (the unique identifier of the uncertainty. To be allocated by JLA team on receipt of final priorities from PSP)</th>
<th>PSP Name</th>
<th>Total number of verified uncertainties identified by the PSP</th>
<th>Uncertainty (PICO formatted indicative uncertainty where possible. Advised minimum requirements are ‘Population’ and ‘Intervention’. Not all submissions may be suitable for PICO structure, but they should be in a format that will ultimately be of value to the research community)</th>
<th>Explanatory note (a plain language summary of up to 150 words, explaining key points of the uncertainty and why it is important, for research funders to begin working on. PSPs may wish to include examples of the original survey submissions here)</th>
<th>Date of the priority setting workshop</th>
<th>Rank of the uncertainty at the final workshop. (If no rank was agreed, please indicate)</th>
<th>Evidence (reference, and weblink where available, to the most recent relevant systematic review identified by the PSP, plus a maximum of 2 other systematic reviews, including protocols for future systematic reviews, that the PSP considers relevant.)</th>
<th>Health Research Classification System (high level HRCS code to be allocated by the JLA team unless the PSP prefers to complete this)</th>
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<td>JLA PLLS PSP</td>
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<td>What are the best ways to measure outcome in lower limb orthopaedic surgery in children?</td>
<td>How will this particular surgery improve the outcome for my child - what are standard outcome measure of success best timing of operation to maximise benefit of operation- Are there adequate validated outcome tools used in children undergoing surgery for the most common conditions?</td>
<td>17-Nov-18</td>
<td>1</td>
<td>SEARCH DONE. NO RCTs or SRs</td>
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<tr>
<td>G.1F</td>
<td></td>
<td>JLA PLLS PSP</td>
<td>26</td>
<td>Following orthopaedic surgery to the lower limbs, what should children’s rehabilitation include, how long is it expected to last and how does it affect the result of treatment?</td>
<td>What is the best rehab post op- What will help to give the fastest recovery? - Is there an optimum amount of rehabilitation and timing of input for different site, soft tissue vs bony surgeries to enable the best outcome? (ie could a matrix be created for the minimum a child should receive to help support local MSK/community teams resource to see these children</td>
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<td>CP.1C.2</td>
<td>JLA PLLS PSP</td>
<td>63</td>
<td>What is the short-term and long-term clinical and cost effectiveness of orthopaedic lower limb surgery (including best timing and technique) for children with Cerebral Palsy who can walk?</td>
<td>What is the optimum time to operate on lower limbs in CP - Optimum surgical intervention for CP manifestations in the lower limb - what are the best treatments for long term gain, either surgical or not, for children and adults with spastic diplegia cerebral palsy - Which procedures are of most benefit?</td>
<td>17-Nov-18</td>
<td>3</td>
<td>SR: Shih et al. Economic evaluation and cost of interventions for cerebral palsy: a systematic review. Dev Med Child Neurol. 2018 Jun;60(6):543-558.</td>
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<td>G.1B.1</td>
<td>JLA PLLS PSP</td>
<td>4</td>
<td>What is the clinical and cost effectiveness of pre-operative rehabilitation in children presenting with lower limb orthopaedic conditions?</td>
<td>Importance/effect of pre-hab on surgical outcomes - What physio would improve outcomes before after surgery?</td>
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<td>DDH 1A</td>
<td>JLA PLLS PSP</td>
<td>20</td>
<td>What is the best method of screening for Developmental Dysplasia of the Hip (DDH) in terms of clinical and cost effectiveness?</td>
<td>DDH - should we do national ultrasound screening? - Can we scan all babies with hip dysplasia to avoid the need for surgery in the future? - is there a better way to screen for DDH other than ultrasound and clinical examination?</td>
<td>17-Nov-18</td>
<td></td>
<td>Systematic review: Shorter D, Hong T and Osborn DA. Screening programmes for developmental dysplasia of the hip in newborn infants (Review). Evid.-Based Child Health. 2013; 8:1: 11–54</td>
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<td>What are the best strategies to optimise communication of information between patients/carers and clinicians in order to enable shared decision-making?</td>
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<td>What is the best management for hip displacement in children with Cerebral Palsy?</td>
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| DDH.1D | JLA PLLS PSP | 38 | 11. What are the most effective interventions (including type and timing of the procedure) for late presenting Developmental Dysplasia of the Hip (DDH)? | 17-Nov-18 | 10 |
| JLA PLLS PSP | 17-Nov-18 | |
| does what is the best surgical treatment for late presenting DDH - Outcome of treatment in late presentations of DDH versus treatment of early presentations of DDH (<3 months) - At what stage does research show that late diagnosis leads to difficulties in correcting DDH? | |

| G.1B.2 | JLA PLLS PSP | 4 | Does vitamin D supplementation or other diet supplements increase recovery rates following lower limb bone surgery, such as osteotomy or leg lengthening? | 17-Nov-18 | 11 |
| JLA PLLS PSP | 17-Nov-18 | |
| Is deficient Vitamin D a reason for poor bone healing? - Does vitamin D supplementation increase recovery rates following bone surgery, such as osteotomy or leg lengthening? | |

| CP.1C.3 | JLA PLLS PSP | 63 | What is the clinical and cost effectiveness of gait analysis in surgical decision making in children with Cerebral Palsy who can walk? | 17-Nov-18 | 12 |
| JLA PLLS PSP | 17-Nov-18 | |
| Can we artificial intelligence to use gait analysis more effectively - Can we have a set of agreed gait/functional outcome measures, which are standardised nationally? - Should a gait analyses be done before any orthopaedic surgery? - What level of gait improvement should be expected by the various surgical procedures on offer? | |

| LL.10.1 | JLA PLLS PSP | 54 | What are the indications and most effective treatment for relapsed clubfoot? | 17-Nov-18 | 13 |
| JLA PLLS PSP | 17-Nov-18 | |
| Relapsing club foot- does active supination need to be treated? - How should we approach a relapsed clubfoot - What is the relapse rate of ponseti after a full (and complied with) treatment regime | |

| SUFE.1.A | JLA PLLS PSP | 22 | What is the optimal surgical treatment and timing of surgery for unstable Slipped Upper/Capital Femoral Epiphysis (SUFE/SCFE)? | 17-Nov-18 | 14 |
| JLA PLLS PSP | 17-Nov-18 | |
| How should we treat unstable SUFE to optimise hip function throughout life course - What is the best treatment for severe unstable SUFE? Is surgical dislocation via ganz osteotomy any better or worse than cuneiform osteotomy? - What is the optimum treatment for an acute or acute on chronic unstable slipped epiphysis | |

| SUFE.1.A | JLA PLLS PSP | 22 | What is the optimal surgical treatment and timing of surgery for unstable Slipped Upper/Capital Femoral Epiphysis (SUFE/SCFE)? | 17-Nov-18 | 15 |
| JLA PLLS PSP | 17-Nov-18 | |
| How should we treat unstable SUFE to optimise hip function throughout life course - What is the best treatment for severe unstable SUFE? Is surgical dislocation via ganz osteotomy any better or worse than cuneiform osteotomy? - What is the optimum treatment for an acute or acute on chronic unstable slipped epiphysis | |

<p>| SR: Wang et al., 2016 | 17-Nov-18 | |
| LL.1P.2 | JLA PLLS PSP | When does surgery produce better patient-centred outcomes than the natural history in flat feet? · Flat feet · how many need orthotics and if so, which sort · what sort of physio (if any) helps · Does pain from flat feet persist after puberty · What role does flat foot surgery have (the arthroereisis screw in particular) · Flat feet · how many need orthotics and if so, which sort · what sort of physio (if any) helps · Does pain from flat feet persist after puberty · What role does flat foot surgery have (the arthroereisis screw in particular) | 17-Nov-18 | SR: Metcalfe S et al. Subtalar joint arthroereisis in the management of pediatric flexible flatfoot: a critical review of the literature. Foot Ankle Int. 2011 Dec;32(12):1127-39. |
| LL.1E.1 | JLA PLLS PSP | What is the outcome of hip replacement in a child compared to hip reconstruction (eg, functionality, how long it lasts, how it is affected by age and underlying diagnosis)? | 18-Nov-18 | SR: Adelani MA, Keeney JA, Palisch A, Fowler SA, Clohisy JC. Has total hip arthroplasty in patients 30 years or younger improved? A systematic review. Clin Orthop Relat Res 2013;471:2595–2601. |
| JLA PLLS PSP | 20 | What are the long-term outcomes of treatment in Developmental Dysplasia of the Hip (DDH) presenting late? | long term evidence for what surgery benefits perthes and ddh - Long term results, multicentre, prospective data in CTEV, DDH surgery (including surgical outcomes) - Long term results, multicentre, prospective data in CTEV, DDH surgery (including surgical outcomes) | 17-Nov-18 | SEARCH DONE. NO RCTs or SRs |</p>
<table>
<thead>
<tr>
<th>Page</th>
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<tr>
<td>CP.1F</td>
<td>JLA PLLS PSP</td>
<td>What is the effect of surgeon and centre experience on the outcome of orthopaedic lower limb surgery in cerebral palsy children?</td>
<td>If surgery is going to be performed on children especially those with rare or relatively rare and complex conditions like CP and SB should that surgery only be determined and performed by a limited number of consultants who are high trained in the condition and the surgical and other options for management of those conditions. In this way the children and families get the best opinions and treatment and outcomes can be monitored, and the centres of excellence can coordinate easily to improve the national standards of care for children and families. This happens in other highly complex conditions requiring surgery eg heart surgery. (Physio) What is the best way to record patient outcomes after hip surgery and multilevel surgery - outcome measures are poor - CP child not patient friendly. (Physio) Would be very important also to develop and use child and parent related functional outcome scores to allow the outcomes of surgery in this group to be assessed (os)</td>
</tr>
<tr>
<td>LL.1D</td>
<td>JLA PLLS PSP</td>
<td>What degree of lower limb anatomical variation (eg. knock knees, bow legs, in-toeing) justifies treatment to prevent long-term problems?</td>
<td>Should we correct lower limb alignment in the asymptomatic patient? - How much of femoral anteversion improves spontaneously - what indicators in the child &lt;8 years are there that it will improve (os)</td>
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<tr>
<td>LL.1B</td>
<td>JLA PLLS PSP</td>
<td>What are the indications for metalwork removal in children who have previously undergone lower limb orthopaedic surgery?</td>
<td>How often does any metal work need to be removed following surgery and for what reasons - Should we remove metal work from children routinely? - Do children need to be on crutches/partial weight bearing to reduce the risk of fracture after removal of metalwork in the legs, and if so, for how long?</td>
</tr>
<tr>
<td>G.1A</td>
<td>JLA PLLS PSP</td>
<td>Why is there geographical variation in the management of lower limb orthopaedic conditions?</td>
<td>What is taken into account when deciding to e</td>
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SEARCH DONE. NO RCTs or SRs | 17-Nov-18 | 26 |