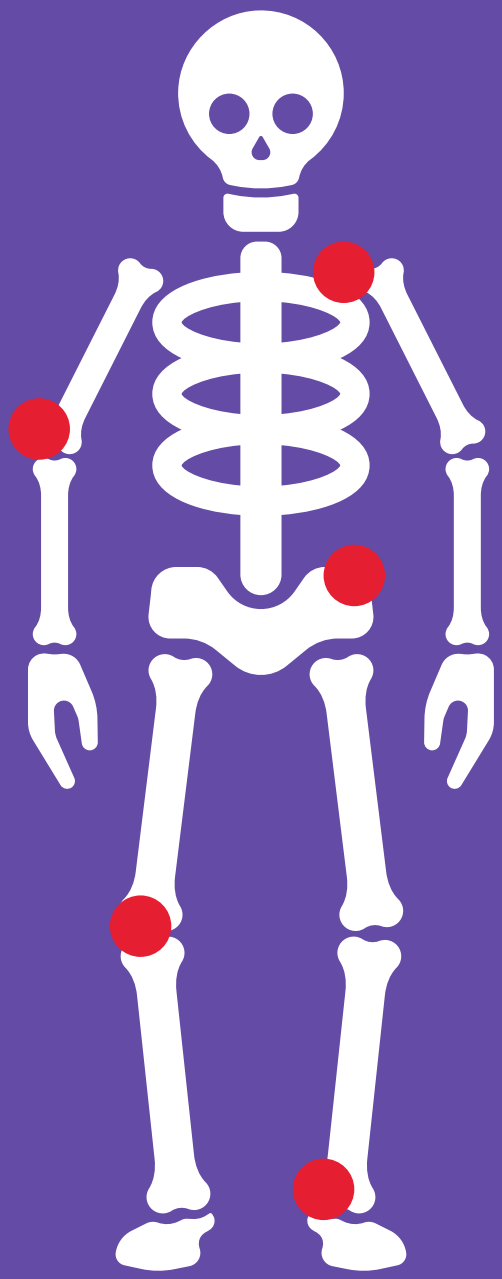
MUSCULOSKELETAL CLINICAL ASSESSMENT IN CHILDREN AND YOUNG PEOPLE



HEALTHCARE PROFESSIONALS

VERSUS ARTHRITIS

WE ARE VERSUS ARTHRITIS

OVER 10 MILLION PEOPLE IN THE UK LIVE WITH ARTHRITIS.[1] AROUND 10,000 OF THESE ARE CHILDREN UNDER 16 YEARS OLD.[2]

The impact of arthritis can be huge, with symptoms such as pain, stiffness and fatigue affecting all aspects of life, from the ability to socialise, work or study, to just being able to live free from pain. Despite being a leading cause of disability, affecting people of all ages, it is often brushed off as an inevitable part of ageing or 'just a bit of arthritis', or left undiagnosed and untreated. Versus Arthritis is here to change that. Arthritis in children and young people has a considerable impact on their school life, development, wellbeing, and also affects the whole family.

Versus Arthritis is dedicated to stopping the devastating impact that arthritis can have on people's lives. When we talk about arthritis, we include all musculoskeletal (MSK) conditions which affect the joints, bones and muscles, including juvenile idiopathic arthritis, osteoarthritis, rheumatoid arthritis, back pain and osteoporosis. Although these long-term conditions may be different in pathology, the impact they can have on people's lives is similar. Pain is the most prevalent symptom for people with arthritis, with many experiencing this every day and living with it for years or even decades.

MSK conditions are a costly and growing problem. Their prevalence is expected to continue to increase due to our ageing population, rising levels of obesity and physical inactivity. The role of healthcare professionals in enabling people with arthritis to live well, to understand their condition, and to have access to the appropriate information and support to self-manage has never been more important.

Early diagnosis and access to the right care can help reduce the impact of arthritis. Versus Arthritis is here to help you. Our education and training resources for healthcare professionals are free, openly accessible, relevant and evidence-based. They are designed to support you to confidently diagnose and manage a range of MSK conditions, as well as hone your skills in providing patient-centred, holistic care. This step-by-step guide aims to support healthcare professionals to be competent and confident in their assessment of children and young people with MSK presentations.

1. Jordan, K.P., Kadam, U.T., Hayward, R., Porcheret, M., Young, C. and Croft, P. (2010). Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. BMC Musculoskeletal Disorders, 11(1). doi: https://doi.org/10.1186/1471-2474-11-144.

2. Humphreys, J. (2023). JIA Additional Rates and Standardisation. University of Manchester. Unpublished

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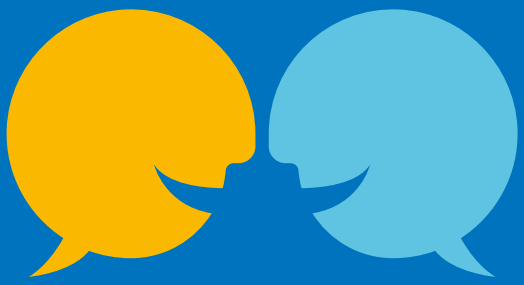

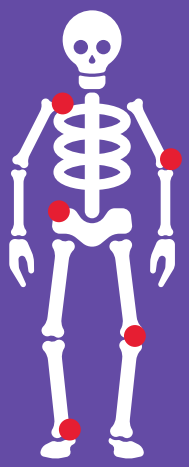

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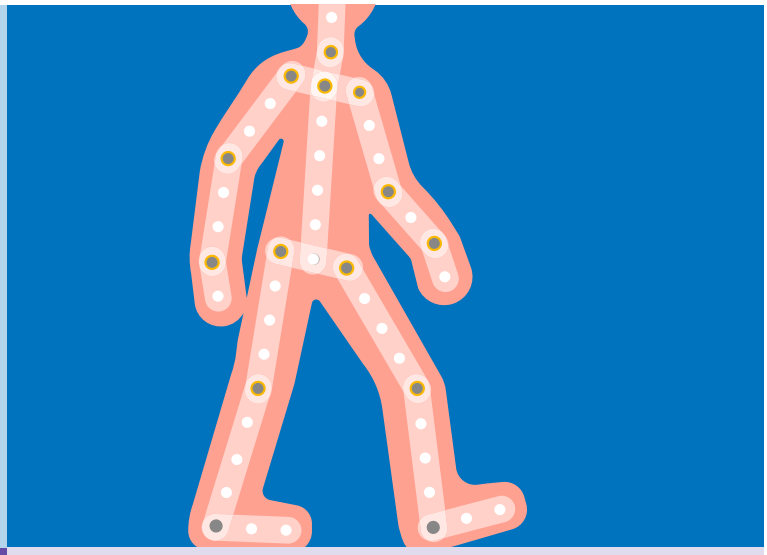

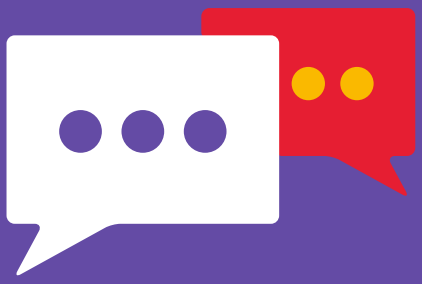

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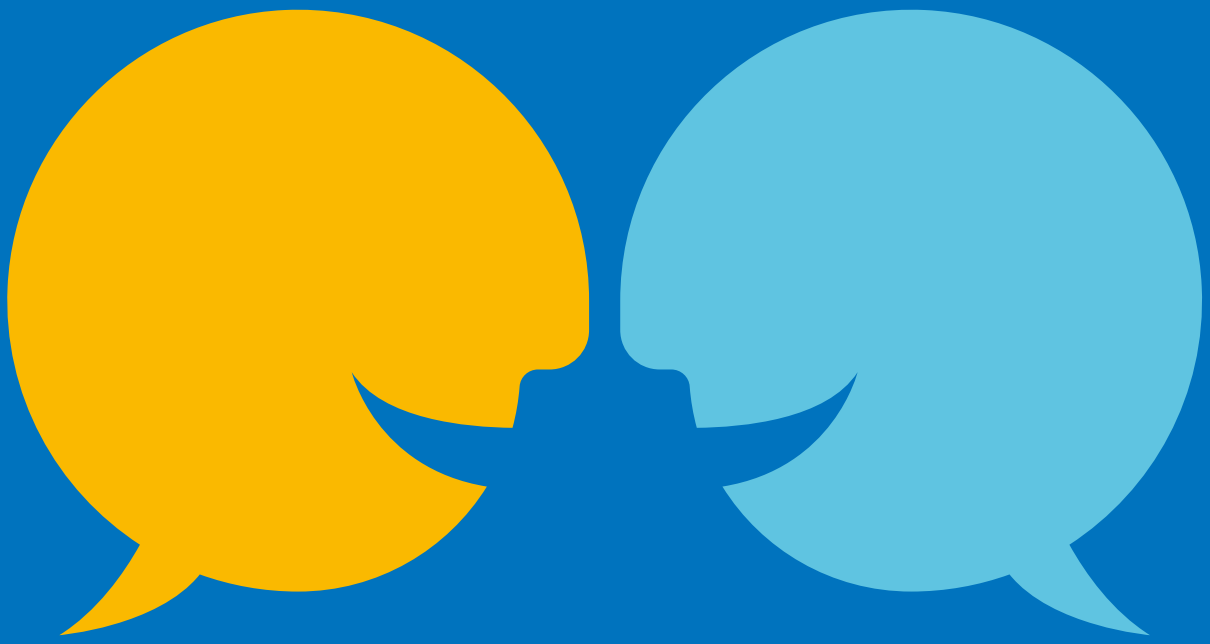

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BIOGRAPHIES

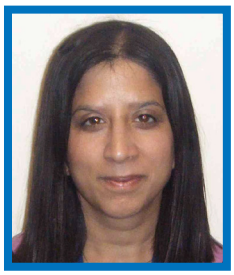
Emerita Professor Helen Elisabeth Foster

Professor of Paediatric Rheumatology,
Co-Chair, Paediatric Global Musculoskeletal Taskforce

Helen Foster graduated from Newcastle University in 1985 and trained originally in adult medicine, adult rheumatology followed by general paediatrics and paediatric rheumatology in the UK and Canada. She was awarded an Arthritis Research Campaign Clinical Research Fellowship 1988-1990. She worked as an NHS consultant at Newcastle Hospitals from 1995 and enabled growth of the regional service and multidisciplinary team. She was appointed as Clinical Senior Lecturer at Newcastle University in 2001, with a Personal Chair in 2008 and awarded Emerita Professor on her retirement in 2021.

The focus of her work is to facilitate access to 'right care' through raising awareness, implementing evidence based clinical practice and focused MSK clinical teaching. Key achievements include development of novel clinical tools (pGALS, pREMS) which are widely embedded in clinical education and free online e-resources (www.pmmonline.org).

As the former Chair of the Royal College of Paediatrics and Child Health Specialty Advisory Committee (CSAC) she was involved in the original UK competency framework for training in paediatric rheumatology, lobbied for greater prominence of MSK teaching for all medical students and within the mandatory examinations for all paediatricians (MRCPCH). Helen represented paediatric rheumatology at international levels to implement evidence based changes in clinical practice and education. She has contributed to policy, standards of care, and clinical guidelines. She is co-founder of the Paediatric Global MSK Task Force which seeks to achieve better MSK health for all children around the world.



Dr Sharmila Jandial

Consultant Paediatric Rheumatologist

Dr Sharmila Jandial is a consultant paediatric rheumatologist at the Great North Children's Hospital, Newcastle upon Tyne.

Following graduation from Glasgow University, Dr Jandial moved to Newcastle for paediatric training. Alongside clinical training in paediatric rheumatology, she was awarded an Educational Research Fellowship by Arthritis Research UK to look in more detail at how to teach joint examination in children.

Dr Jandial was appointed as a consultant at the Great North Children's Hospital in 2011 and enjoys working within a multidisciplinary team. She leads on services for paediatric uvetis and autoinflammatory diseases.

She has a strong interest in education and research, particularly around educational interventions to optimise diagnosis and referral for children and young people with juvenile idiopathic arthritis.

Dr Jandial is currently the Chair of the Royal College of Paediatrics and Child Health Specialty Advisory Committee (CSAC) and is involved in both undergraduate and postgraduate teaching.

Dr Diarmuid McLaughlin

Paediatric Rheumatology Registrar

Diarmuid McLaughlin is a paediatric rheumatology registrar currently completing the final stages of his training at Great Ormond Street Children's Hospital, London. He has a keen interest in teaching, and has recently completed a Masters of Science in Clinical Education focusing on the teaching of paediatric musculoskeletal medicine amongst undergraduate medical students.

He is passionate about raising awareness of paediatric rheumatology and the teaching of paediatric MSK clinical skills to medical students and doctors.

BIOGRAPHIES

Dr Matthew Keir

General Practitioner

Dr Matthew Keir is a General Practitioner working in the north-east of England, and currently splits his time working in both primary care and with the medical education team at Newcastle University.

Matthew is interested in improving links between community- and hospital-based services and in the clinical teaching of undergraduate medical students.

Dr Charlene Foley

Paediatric Rheumatology Consultant

Dr Charlene Foley is a Paediatric Rheumatology Consultant at the Evelina Children's Hospital, London. Charlene very much enjoys the combination of clinical and research activity within her day-to-day practice of paediatric rheumatology. Her research interests include Down syndrome associated arthritis and JIA.

FOREWORD

Aimee Kelly

Hi, my name is Aimee, and I am 20 years old. At the age of 12 I was diagnosed with polyarticular juvenile idiopathic arthritis (JIA). Before my diagnosis I was a keen Irish dancer, which meant I was practising in class twice a week and competing at the weekends.

About a year before my diagnosis my ankle had started to bother me; it was later suspected that it was a stress fracture, and I was put in an air boot. Around the same time my mum started to notice me lifting things differently and my fingers started to swell. After this, Mum took me to the GP who recommended doing bloods; my rheumatoid factor was very slightly raised. As a formality I was referred to Musgrave Park Hospital where I was later diagnosed. After my diagnosis, the GP that recommended me for bloods was very helpful in supporting me and explaining my treatments and managing my blood results. I have found over the years that not all GPs are as familiar with JIA and this can be frustrating as I have found that managing my diagnosis may mean changing medications, which could be supported more with bloods for inflammatory markers to help consultants with treatment plans.

Looking back, there were many instances when my arthritis was visible but went undiagnosed, for example the stress fracture in my ankle which I later found out was arthritis, and my index finger on my right hand was suspectedly sprained after an x-ray determined it was not broken. These examples are why I think that this resource is so important, so that the signs and symptoms of JIA are more widely recognisable, and a diagnosis can be reached more quickly, and relevant treatment can start.

ABBREVIATIONS

DA Down-syndrome-associated arthritis

HIV human immunodeficiency virus

JIA juvenile idiopathic arthritis

MCP(J) metacarpophalangeal (joint)

MSK musculoskeletal

NSAIDs non-steroidal anti-inflammatory drugs

pGALS paediatric Gait, Arms, Legs and Spine

PMM Paediatric Musculoskeletal Matters

pREMS paediatric Regional Examination of the Musculoskeletal System

STI sexually transmitted infection

SLE systemic lupus erythematosus

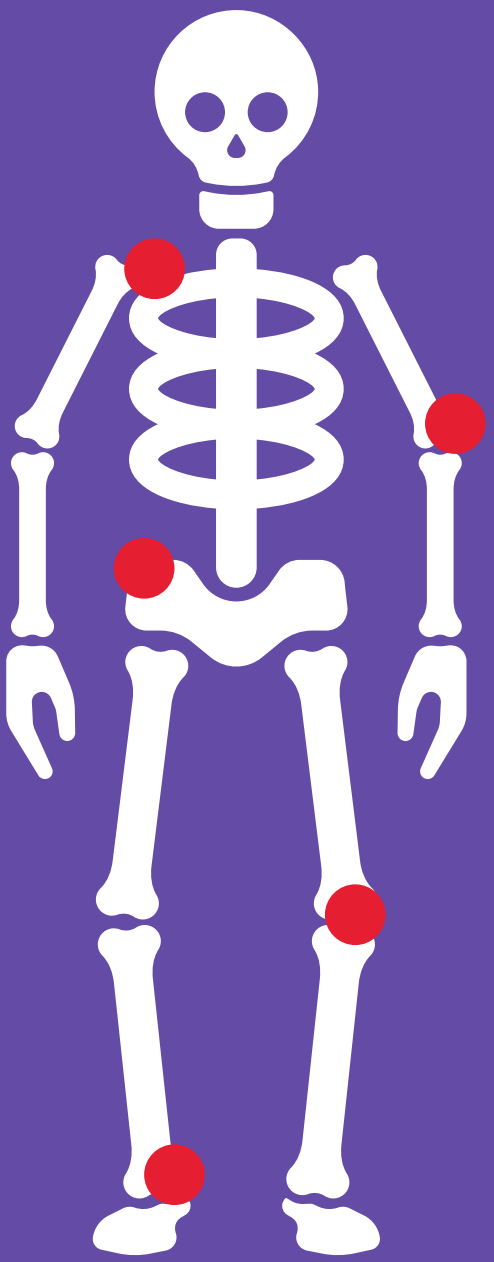
TB tuberculosis

ACKNOWLEDGEMENTS

Firstly, a special thanks to Aimee Kelly for sharing her story, and for highlighting the importance of a timely diagnosis for all children and young people with arthritis to ensure they get the best care and treatment possible.

We remain indebted to the work of Professor Helen Foster, whose research led to the development of the pGALS and pREMS examination tools which are the focus of this guide. We would also like to acknowledge the work of Professor Paul Dieppe and Dr David Coady in the development of the adult GALS and REMS examinations as their text remains influential in this new paediatric edition.

We would like to thank Professor Helen Foster, Dr Sharmila Jandial, Dr Diarmuid McLaughlin, Dr Matthew Keir and Dr Charlene Foley for their time and commitment in creating the content for this guide, and thanks to Maura Scott, Melissa Mulholland, Anna Raczkowycz, Jo-Anne Shaw, David Hanna and William Rafferty who all took the time to review and comment on the draft versions. We would also like to express our gratitude to Dr Barbara Salas Revuelta and Newcastle University for granting Versus Arthritis permission for use of all the illustrations within this guide.



02. INTRODUCTION

INTRODUCTION

MSK presentations are common in children (approx. 1 in 8)[3] with a wide spectrum of causes ranging from normal developmental concerns (e.g. flat feet) to more serious causes including infection, malignancy and non-accidental injury. In addition to these, potentially disabling conditions can present with MSK symptoms including inflammatory arthritis, orthopaedic and metabolic conditions and neuromuscular diseases.

Competent and careful clinical skills (history taking and examination), knowledge of normal MSK development and judicious use and interpretation of investigations are key to making an accurate diagnosis.

This resource aims to guide your clinical assessment, with the inclusion of a Question & Answer section on frequently encountered scenarios and a Top Tips section to aid teaching of musculoskeletal skills. Links are provided throughout primarily to the Paediatric Musculoskeletal Matters (PMM) Portfolio and other useful websites for further evidence-based information. PMM is a completely free and open resource – no registration is required.

We hope that you find the following information useful to aid with your clinical practice.

3. Tan, A., Strauss, V.Y., Protheroe, J. and Dunn, K.M. (2018). Epidemiology of paediatric presentations with musculoskeletal problems in primary care. BMC Musculoskeletal Disorders, 19(1). doi: https://doi.org/10.1186/s12891-018-1952-7.

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17 SWELLING

17 STIFFNESS

18 SYSTEMIC FEATURES AND RED FLAGS

18 IMPACT ON CHILD AND FAMILY

19 ADDITIONAL FEATURES TO CONSIDER FOR A CHILD WITH A LEARNING DISABILITY

19 FURTHER INFORMATION ON HISTORY TAKING

GENERAL

- Ensure to involve the child/young person as well as the carer – opening questions help to establish rapport.
- **Enquire about:**
  - general concerns: e.g. pain, swelling, stiffness, deformity, limp.
  - observations from others: e.g. teachers.
  - duration of symptoms – consider acute, chronic or subacute.
  - history of trauma, injury or prior illness.
  - fluctuation and frequency of symptoms – any diurnal variation.
- **Family history:** e.g. inflammatory arthritis, muscle disease, autoimmune diseases, fever syndromes, infections (ask about TB).
- **Social history:** consider consanguinity
- **Medical history:** previous illnesses/surgery/conditions that predispose to arthritis (e.g Down's syndrome/inflammatory bowel disease).
- **Vaccination history:** e.g. rubella causing a reactive arthritis.
- **Travel history:** e.g. reactive arthritis or Lyme disease.
- **Sexual history (adolescent):** e.g. STI causing a reactive arthritis. Consideration of safeguarding concerns is paramount.
- **Medications and drugs:** including illicit substances. Consider risk for HIV, Hepatitis B, C.
- **Diet:** e.g. calcium intake and vitamin D, specifically considering rickets.
- **Growth and development:** birth history, general and MSK development, motor milestones. Review growth chart. Important to know what is normal. Further information on gait, normal variants, and motor milestones can be found on the PMM website.

PAIN

- **SOCRATES: S**ite, **O**nset, **C**haracter, **R**adiation, **A**ssociated features, **T**iming/duration, **E**xacerbating/Alleviating factors (e.g. response to NSAIDs), **S**everity.
- **Unilateral, focal, persistent pain** is concerning.
- **Referred pain** from the hip may present as thigh or knee pain e.g. transient synovitis.
- **Flitting pain** from one joint to another with or without joint swelling can be indicative of acute rheumatic fever.
- **Persistent night waking** with other concerning features (limp, unilateral pain) – think of red-flag conditions. Leg pain at night can also be due to growing pains but caution is needed (see Q&A section for further advice on this).
- **Mechanical or inflammatory pain** – mechanical (worse with activity, end of the day) or inflammatory pain (associated with stiffness or gelling, worse in morning, may improve with activity). Further information can be found on the PMM website.

SWELLING

- Along with the presence of pain and stiffness, swelling can help identify an inflammatory cause from a non-inflammatory or mechanical cause.
- Swelling can be overlooked if symmetrical or subtle: Important to be aware of how children's joints change with age. Further information regarding this can be found on the PMM website.

STIFFNESS

May be noticed by parents or carers as one of more of the following:

- **change in activities, regression of milestones** (e.g. reluctance to dress or use stairs when previously able to do so).
- **limp or difficulty weight-bearing;** may be worse in mornings.
- **episode of 'gelling' after periods of rest:** this term may be used to describe slowness or difficulties in joint movement after periods of rest – e.g. after a car journey or arising from sitting position.

SYSTEMIC FEATURES AND RED FLAGS

- **Systemic enquiry of key systems**: skin, eyes, brain, heart, lungs, kidney – involvement may suggest multisystem disease, inflammatory arthritis or muscle disease.
- **Other signs of inflammatory disease** include fever, lethargy, weight loss, night sweats, mouth ulcers, hair loss, lymphadenopathy.
- Careful consideration to exclude these signs from those found in other red-flag conditions.
- **Presence of a limp** requires careful immediate assessment particularly in association with a fever (e.g. in leukaemia). Other red-flag symptoms include weight loss, lethargy, bruising, night pain.
- Further information on the limping child can be found on the PMM website.
- It is important to remember that any child with a limp that is not resolving requires a medical review. Careful safety netting to parents is important including to return if deterioriation in symptoms is noted, the child is not weight bearing or they become systemically unwell (e.g. fever, bruising, fatigue, weight loss).
- **Red-flag conditions** include malignancy (leukaemia), infection (septic arthritis, osteomyelitis, rheumatic fever, TB) or non-accidental injury (child abuse).
- Further information about red flags can be found on the PMM website.

IMPACT ON CHILD AND FAMILY

Ask about:

- **General and interests** – play, games, sport, hobbies, school.
- **Recent events** in home or school environment.
- **Change in behaviour, mood,** interference with **sleep.**
- **Impact at school:** deterioration in schoolwork (e.g. handwriting), attendance, interaction with peers.
- **Limitation of activities** (dressing, toileting, stairs), **restriction of participation** (play, sport, exercise, school).

ADDITIONAL FEATURES TO CONSIDER FOR A CHILD WITH A LEARNING DISABILITY

Changes in level of function?

- Has there been **regression** in motor milestones?
- Is the child **requiring assistance** with activities of daily living that they previously could complete without help?
- Have they become **less active** with apparent reduction in exercise tolerance?
- Do they prefer to be **carried down the stairs** in the morning?
- Have there been **reports of change at school or nursery** (e.g. schoolwork, handwriting, walking, sitting or transferring ability)?

Changes in the child's behaviour?

- Are they **seeking comfort** or rubbing their joints?
- Do they dislike having their hand held or having their nails cut?
- Are they less willing to partake in games or structured physiotherapy?
- Have they made **subtle adaptations** such as 'bottom shuffling' down the stairs, or holding a stair rail with their whole arm rather than their hand?
- Have there been reports of change at school or nursery (e.g. mood, irritability, fatigue)?

Changes in physical appearance?

- Has there been a change in the **shape of their fingers?**
- Has their **gait become slower** or stiffer?
- Do they **fall/stumble/trip** more than before?

FURTHER INFORMATION ON HISTORY TAKING

What to ask and why in a MSK history

Top Tips to MSK history

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pGALS ASSESSMENT

pGALS (**p**aediatric **G**ait, **A**rms, **L**egs and **S**pine) is an simple, quick approach to assessing a child with an MSK concern. pGALS is validated in school-aged children but younger children can easily do it also. pGALS takes approximately 1–2 minutes to perform and helps to discern abnormal joints due to a variety of causes (rheumatological, orthopaedic, neurological and neuromuscular). pGALS is not diagnostic of any condition. The findings need to be interpreted in the clinical context but are key to a differential diagnosis and guiding further assessment and investigations.

pGALS is similar to the adult GALS examination with a number of features added. A table of the key differences can be found in appendix 2.

The sequence of the pGALS examination does not have to be performed in the order of gait, arms, legs and spine; it is presented in that manner to aid learning.

If an abnormality is detected using pGALS, a more detailed examination of the affected joint(s) can be undertaken via a **pREMS** approach (**p**aediatric **R**egional **E**xamination of the **M**usculoskeletal **S**ystem). This should include examination of the joint above, below and opposite in addition to the area of concern.

SCREENING QUESTIONS

Three screening questions are first asked as part of pGALS:

Question	Rationale
Do you (or does your child) have any pain or stiffness in your (their) muscles, joints or back?	emphasis on common symptoms of an MSK problem
Do you (or does your child) dress yourself (him/herself) completely without any difficulty? *	emphasis on upper limb function
Do you (or your child) walk up and down stairs without any difficulty? *	emphasis on lower limb function

*If unable to comment on difficulty dressing or use of stairs then alternative questions include: Can the child squat or reach up without difficulty?

GENERAL APPROACH

- Introduce yourself and obtain (verbal) consent/assent.
- Chaperone as necessary.
- Observe child walking into clinic room or playing at rest.
- Appropriately expose (be aware of cultural sensitivity and gender).
- Watch for non-verbal signs of distress/pain (e.g. facial expression, withdrawing limb).
- Carefully check for symmetry and look for joint swelling, abnormal posture, muscle wasting.
- Perform the whole examination – joint involvement may not be obvious from the history and may have been overlooked by the parent or carer. Although changes may be subtle, joint involvement can be helpful to establish the diagnosis.
- A '**copy me**' approach can be particularly helpful, sitting opposite the child – often makes the examination a form of play and helps with younger children.
- With younger children and those who may not be able to follow this approach, particular emphasis is placed upon observation and being opportunistic/using distraction techniques whilst examining.
- Further advice on general approach.

INDIVIDUAL STEPS OF pGALS

Gait

- Whilst child is standing, observe from the front, sides and back. Check for general demeanour, body posture and proportions (trunk/ limbs considering short stature/ marfanoid syndromes). Check for any evidence of dysmorphism. Inspect the skin (rashes/bruising/ scars/elasticity). (See figure 1).
- Observe child walking, turning and returning back. Consider normal patterns of walking and milestones as you observe.
- Ask: "walk on your tiptoes" then "walk on your heels". (See figure 2 and 3).
- Check for arm movement as they walk.
- Check for trunk stability/posture as they walk.
- Getting the child to run up and down may help them settle and may demonstrate subtle limp.

Assesses:

- posture, balance, body habitus, skin rashes.
- muscle bulk (atrophy), leg alignment (valgus or varus), spine (scoliosis/kyphosis).
- joint swelling, leg length difference.
- foot posture (specifically arches when on tiptoes).
- joints of the feet, ankles.

Figure 1

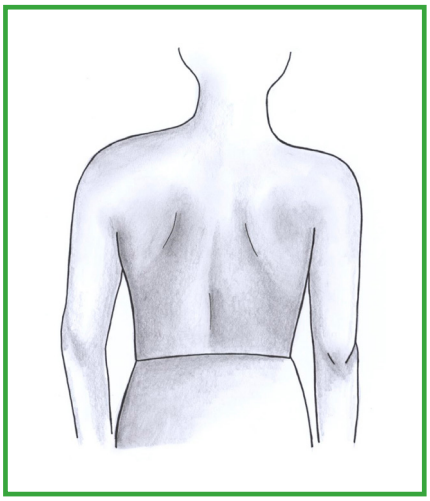


Figure 2

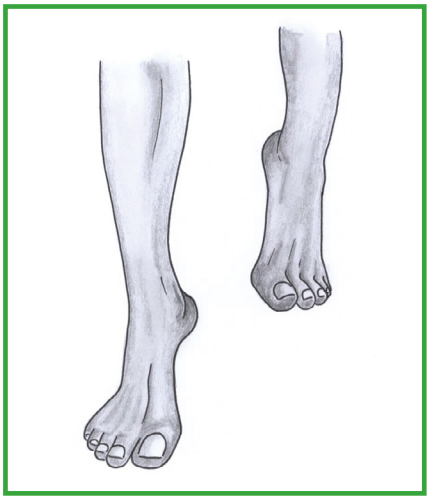
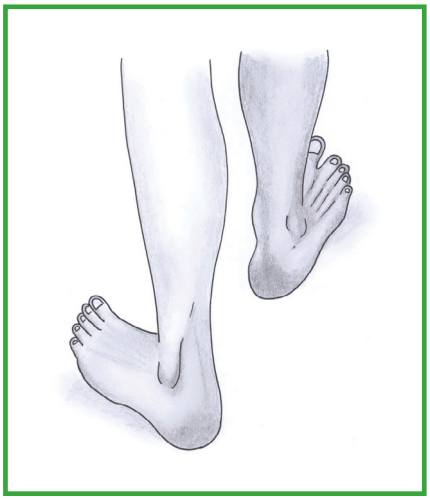


Figure 3



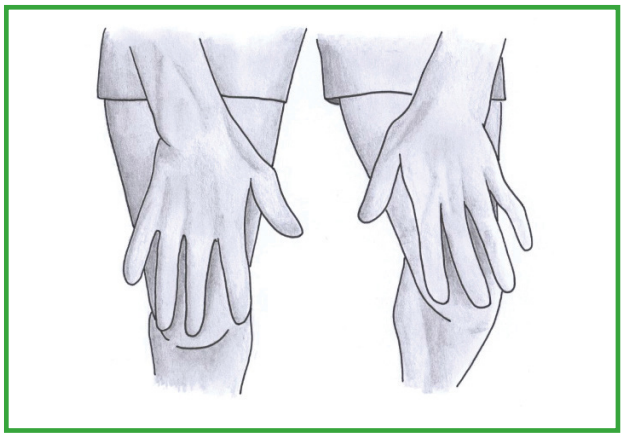
Arms

Ask: "Hold your hands straight out in front of you keeping your elbows straight", specifically looking for nail changes, skin changes (e.g. psoriasis). (See figure 4)

Assesses:

- forward flexion of the shoulders, elbow extension.
- wrist extension, finger extension.
    - > May give indication of hypermobility (if not symmetrical, then consider pathology).
- supination.

Figure 4

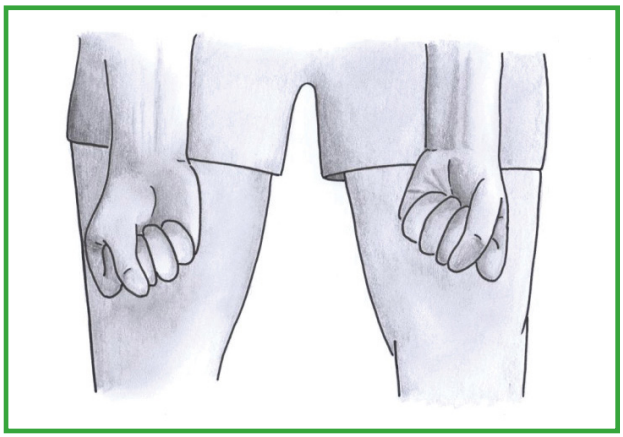


Ask: "Turn your hands over and make a fist". Look at muscle bulk of thenar and hypothenar eminences. (See figure 5).

Assesses:

- elbow and wrist supination.
- finger flexion, grip strength.

Figure 5



INDIVIDUAL STEPS OF pGALS

Ask: “Pinch index finger and thumb together”, followed by “Touch the tips of your other fingers with thumbs”. (See figure 6 and 7)

Assesses:

- manual dexterity, fine motor function.
- coordination of finger joints.
  - > May give indication of hypermobility (if not symmetrical, then consider pathology).

Figure 6

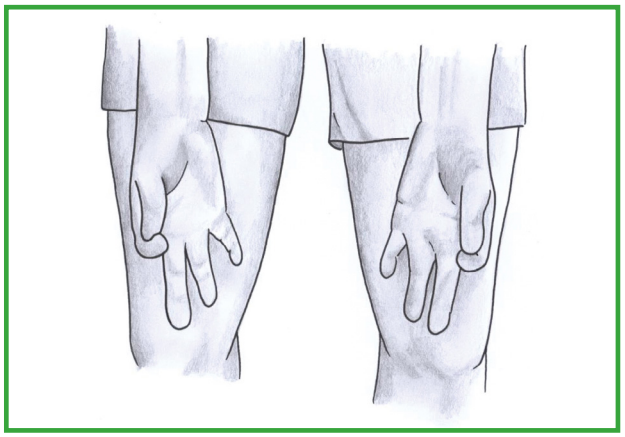
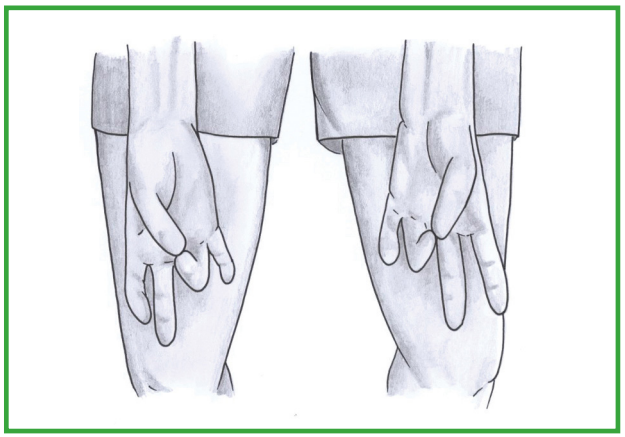


Figure 7

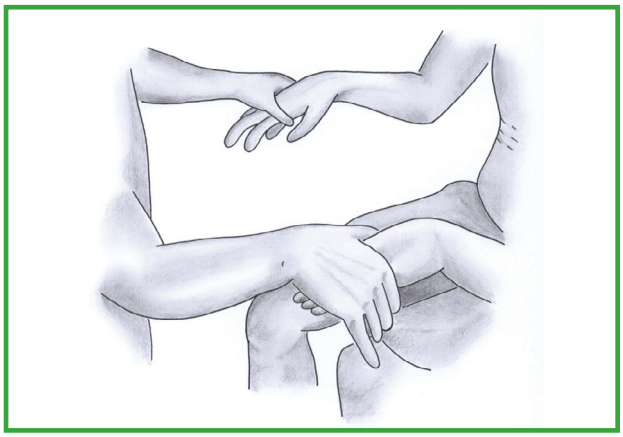


Ask: “Hold your hands straight out and I will carefully press across your knuckle joints”. (See figure 8)

Assesses:

- Metacarpophalangeal (MCP) joints for the presence of any pain or swelling.

Figure 8



Ask: “Place your hands together – palm to palm” followed by “back to back”. (See figure 9 and 10)

Assesses:

- extension of finger joints.
- wrist extension and flexion.
- elbow flexion.
- coordination of finger joints.
    - > May give indication of hypermobility (if not symmetrical, then consider pathology).

Figure 9

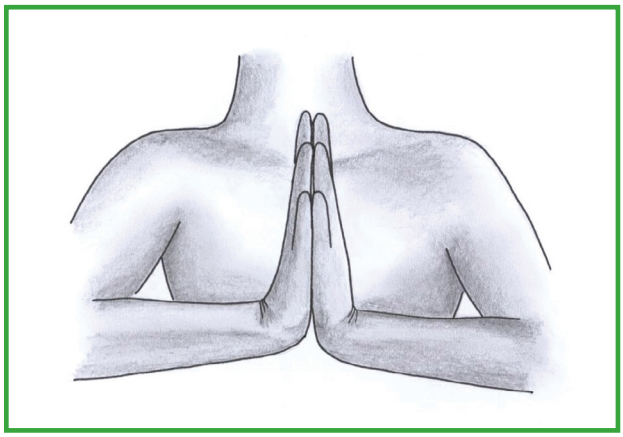
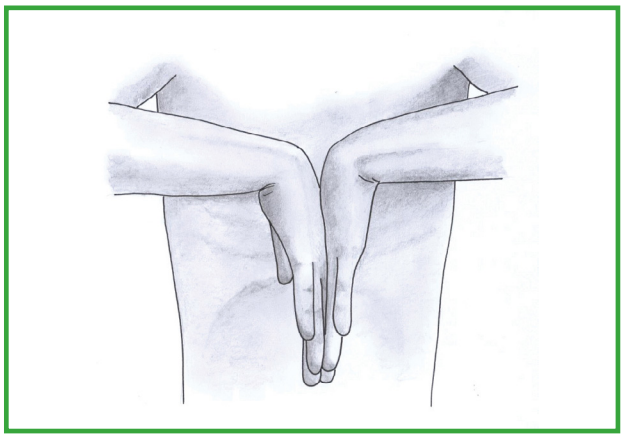


Figure 10



Ask: “Reach up and ‘touch the sky’ then look at the ceiling.” (See figure 11 and 12)

Assesses:

- neck extension.
- shoulder abduction.
- elbow and wrist extension.
    - > May give indication of hypermobility (if not symmetrical, then consider pathology).

Figure 11

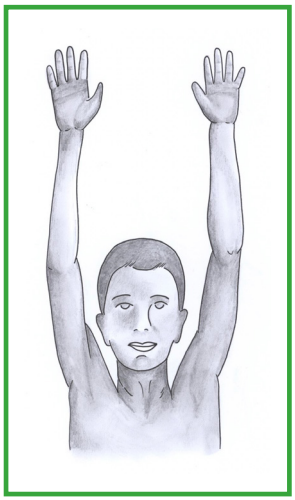
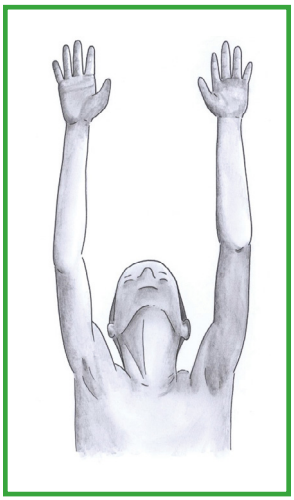


Figure 12



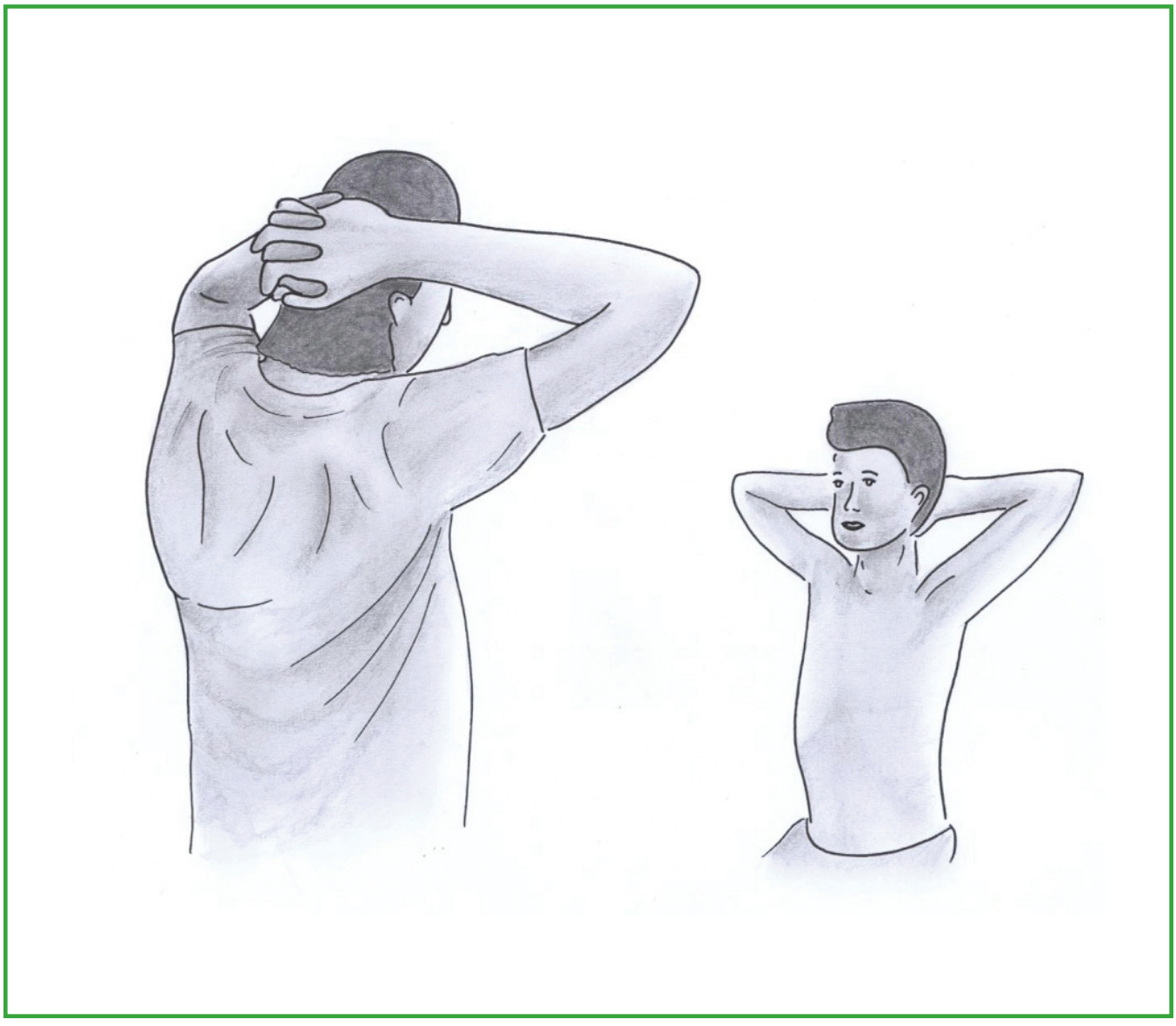
INDIVIDUAL STEPS OF pGALS

Ask: “Place your hands behind your neck.” Look at elbows for skin changes, skin elasticity. (See figure 13).

Assesses:

- shoulder abduction.
- external rotation of the shoulders.
- elbow flexion.
    - > May give indication of hypermobility (if not symmetrical, then consider pathology).

Figure 13



Legs

- Observe first – inspect for a leg length discrepancy, soles of the feet, posture, muscle bulk, swelling, scars, alignment.
- With the child lying supine, palpate for an effusion of the knee (patellar tap, sweep/bulge test). (See figure 14).

Assesses:

- knee effusions, crepitus of the knee.
- knee flexion and extension.
- hip flexion and internal rotation.

- Ask: "Bend your knee and bring your foot back towards your buttock" – check for symmetry. (See figure 15).
- Ensure the legs are stretched out straight to full extension (lack of full knee extension can be an indicator of joint disease) – holding the child's feet may help to assess full extension/passive hyperextension.
    - > Excess hyperextension may give indication of hypermobility (if not symmetrical, then consider pathology).
- Passively flex the child's hip followed by assessing internal rotation (with hand placed over the knee, palpating for crepitus) (See figure 16).

Figure 14

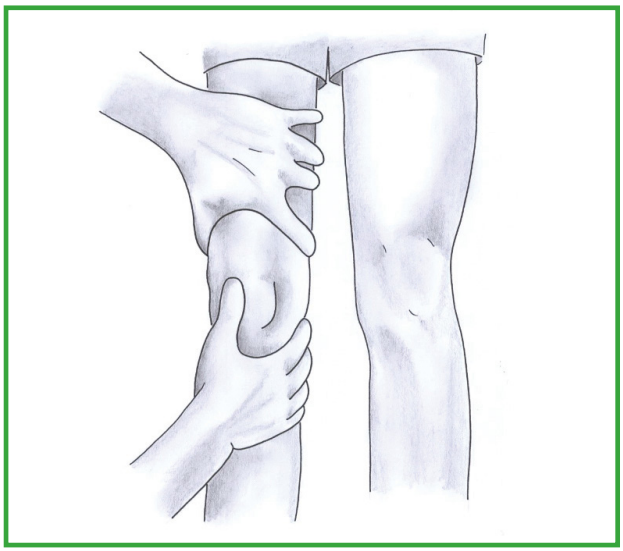


Figure 15

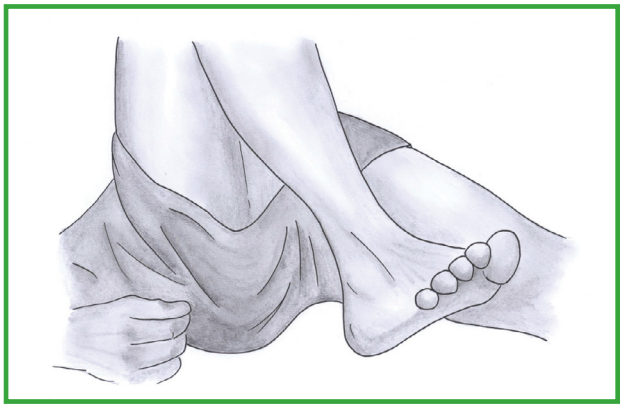
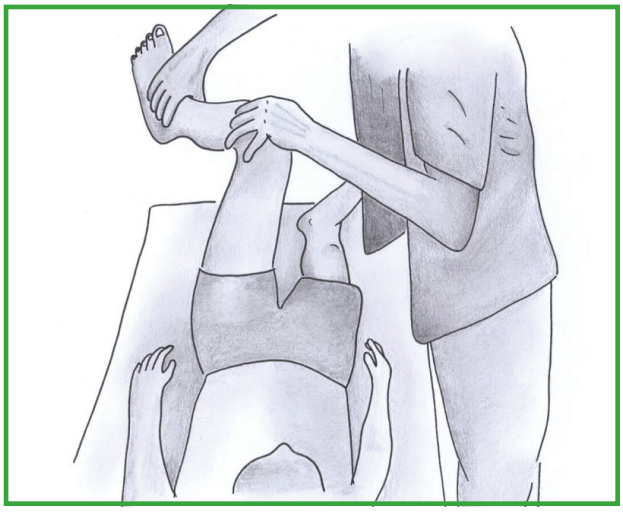


Figure 16



INDIVIDUAL STEPS OF pGALS

Spine

Ask: “Touch your shoulder with your ear”. (See figure 17).

Assesses:

- cervical spine lateral flexion.

Figure 17

With the child standing, ask: “Bend forward and touch your toes”, specifically inspecting the spine for scoliosis, lordosis, kyphosis. (See figure 18).

Assesses:

- forward flexion of the spine (thoraco-lumbar).
  - > May give indication of hypermobility if can place hands on the floor.

Figure 18

Ask: “Place your own 3 fingers in your mouth.”
(See figure 19).

Assesses:

- temporomandibular joints (ensure to look for deviation of the jaw or a small jaw micrognathia). Listen for clicks.

Figure 19

FURTHER INFORMATION ON pGALS

Summary of pGALS assessment and checklist

Video demonstration detailing pGALS

pGALS app contains breakdown of pGALS steps, top tips and further pGALS resources with multiple language translations (all free and available as PDF versions), it can be downloaded from PMM website

A short e-module is available, based on 'Introduction to paediatric musculoskeletal clinical skills: pGALS and beyond'

pGALSplus – Toolkit based on pGALS containing questions and assessments with additional manouvres to aid with the identification of children with potential serious MSK related issues

Review of normal gait, normal variants and motor milestones

Abnormal gait patterns

Top tips and key points of approaching a limping child

A publication relating to the use of the pGALS approach

pGALS has been translated into many different languages. A downloadable PDF summary of pGALS in a variety of languages. Changes can be found on the PMM website

A proforma for recording pGALS can be downloaded as a PDF from the PMM website

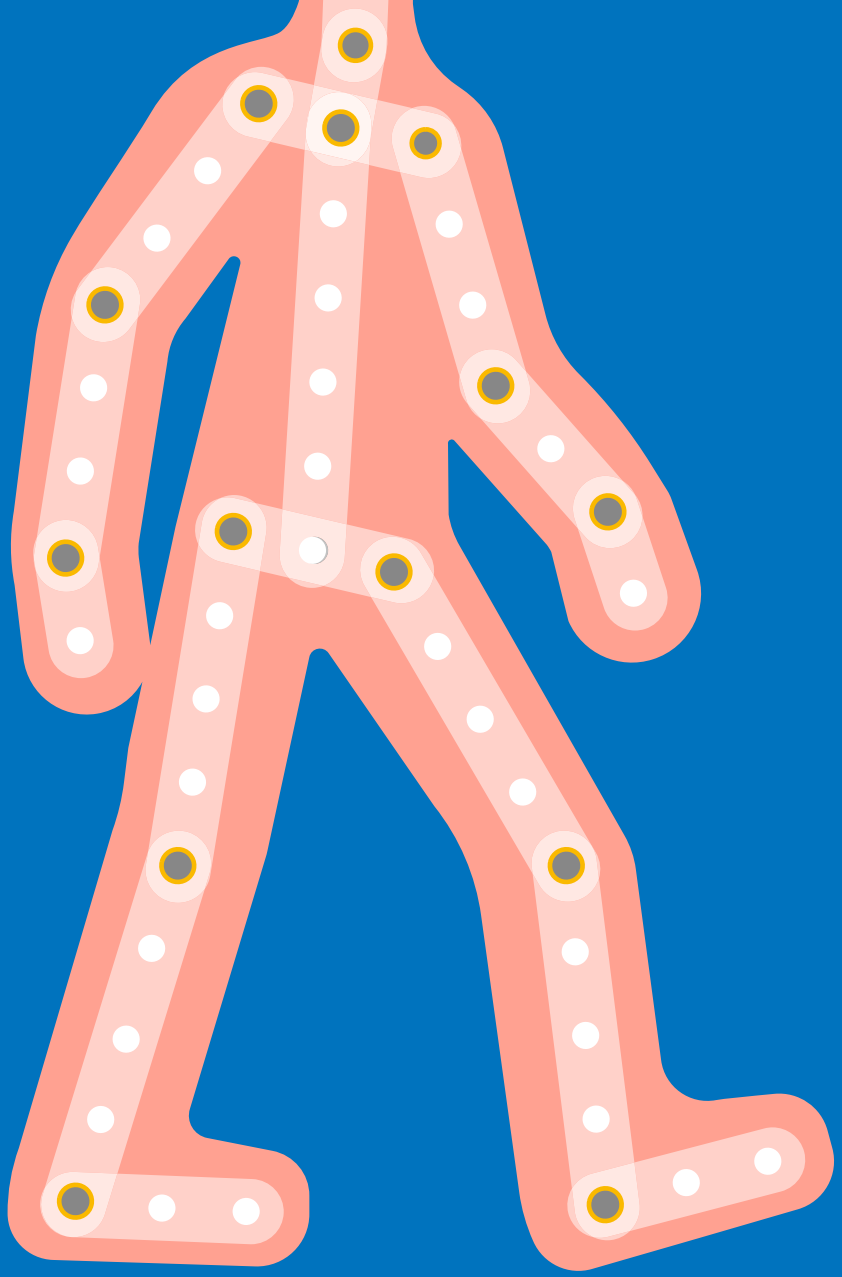
PERFORMING VIRTUAL pGALS

pGALS can be performed whilst conducting a virtual consultation. Ensure the child and family are aware beforehand of what will happen. Instructions/graphics of the various pGALS manoeuvres can be sent beforehand to allow the family to partake fully. The focus on the consultation is on observation and function. Remember pGALS can be performed in any order to suit the required scenario and technology set-up or timing.

All information necessary to conduct this is contained within the following downloadable PDF document

A step-by-step checklist can be downloaded from the PMM website

Further information and links to key telehealth resources are available on the PMM website including a version of pGALS for remote working – V-pGALS



05. DETAILED MUSCULOSKELETAL EXAMINATION: pREMS ASSESSMENT

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36 INTRODUCTION
37 LOOK
37 FEEL
38 MOVE
39 FUNCTION
40 SPECIAL TESTS
43 PATTERN OF JOINT INVOLVEMENT
44 pREMS RECORDING PROFORMA

pREMS ASSESSMENT

INTRODUCTION

- If an abnormality is detected using pGALS, a detailed examination of the affected joint(s) can be undertaken via a pREMS (paediatric Regional Examination of the Musculoskeletal System). This is similar to the adult REMS of each joint with a number of additional elements (special tests) that are explained below.
- For joint-specific examination techniques, please see the individual checklist of each pREMS in appendix 1 of this document.
- A PDF proforma for each pREMS is available.
- The basic principles of the pREMS assessment are:
  - **Introduction**
  - **Look**
  - **Feel**
  - **Move**
  - **Function**
  - **Special tests**

- Introduce yourself and obtain (verbal) consent/assent.
- Chaperone, as necessary.
- Observe child walking into clinic room or playing at rest.
- Appropriately expose (be aware of cultural sensitivity and gender).
- Watch for non-verbal signs of distress/pain (e.g. facial expression, withdrawing limb).
- Carefully check for symmetry and look for joint swelling, abnormal posture, muscle wasting.
- Perform the whole examination – joint involvement may not be obvious from the history and may have been overlooked by the parent or carer. Although changes may be subtle, joint involvement can be helpful to establish the diagnosis.
- A '**copy me'** approach can be particularly helpful by sitting opposite the child – often makes the examination a form of play and helps with younger children.
- Further advice on general approach can be found on the PMM website.

LOOK

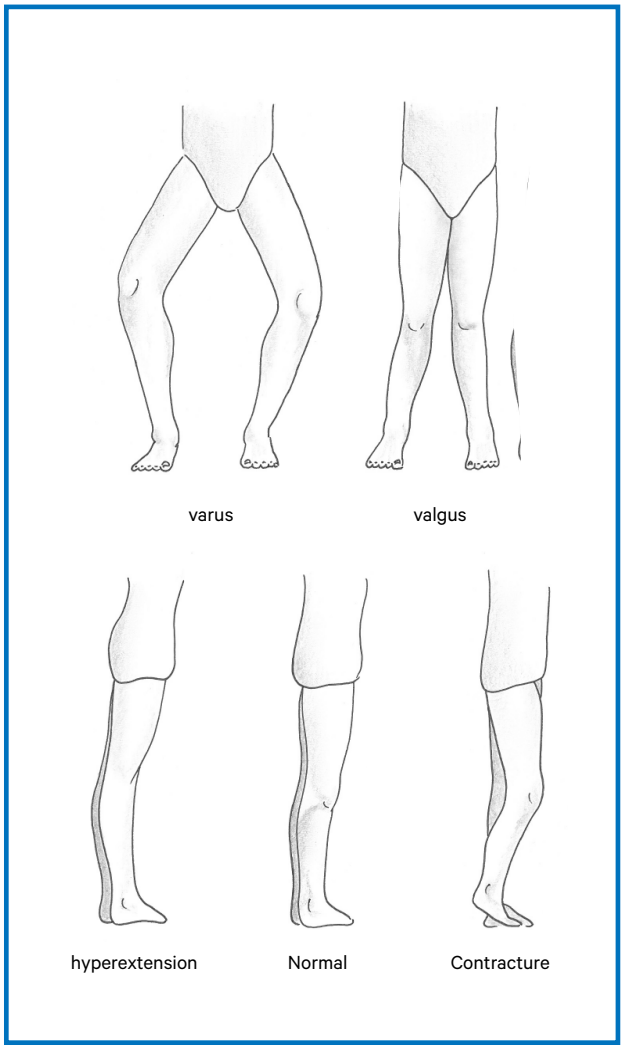
- Appropriately expose.
- Comparing both sides, look specifically for:
    - > rashes, muscle bulk, swelling, scars.
    - > posture and alignment of joints (See figure 20).
    - > footwear, walking aids or other bedside clues.

A useful overview of surface anatomy can be found on the PMM website.

FEEL

- Temperature
- Swelling
- Tenderness
- Crepitus
- Muscle tone

Figure 20.
Leg alignment terminology



MOVE

- **Active movements** (where patient moves joints): use **'copy me'** approach.
- **Passive movements** (where examiner moves joints):
- **Note ranges of movements** – normal ranges can be found on the PMM website. A number of additional movements are shown in figures 21, 22 and 23.
- Some children have **hypermobile joints:** further information on this can be accessed through the PMM website. Changes of hypermobility are symmetrical – if not, then consider pathology.
- If active movement is restricted but passive movement is normal this may indicate a muscular, tendon or nerve issue rather than an issue with the joint.
- Loss of movement can be recorded in degrees or as mild, moderate or severe.

Figure 21.
External rotation of the hip

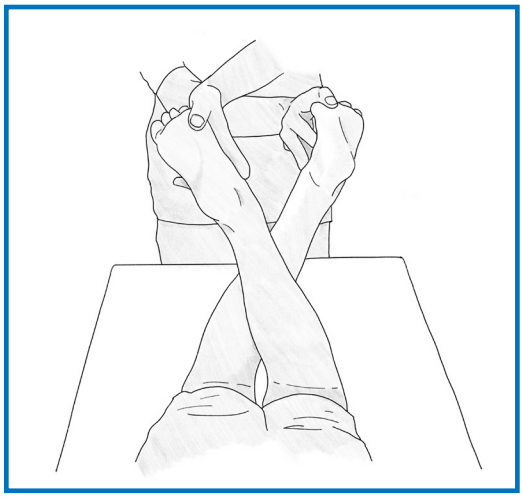


Figure 22.
Internal rotation of the hip

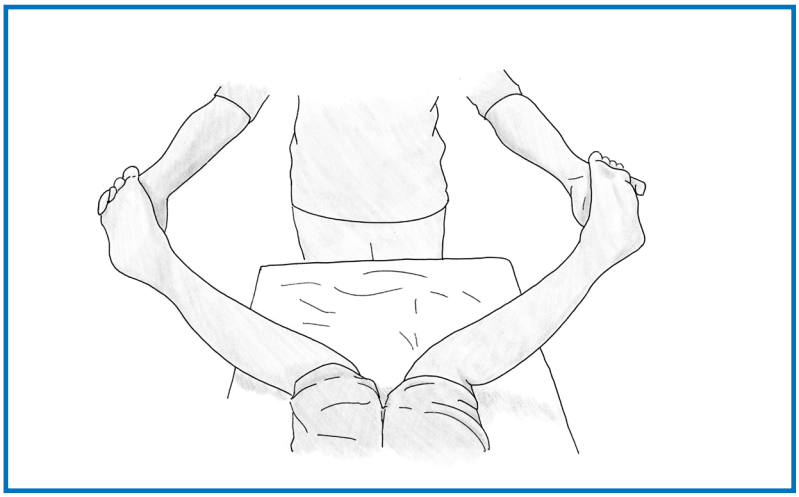
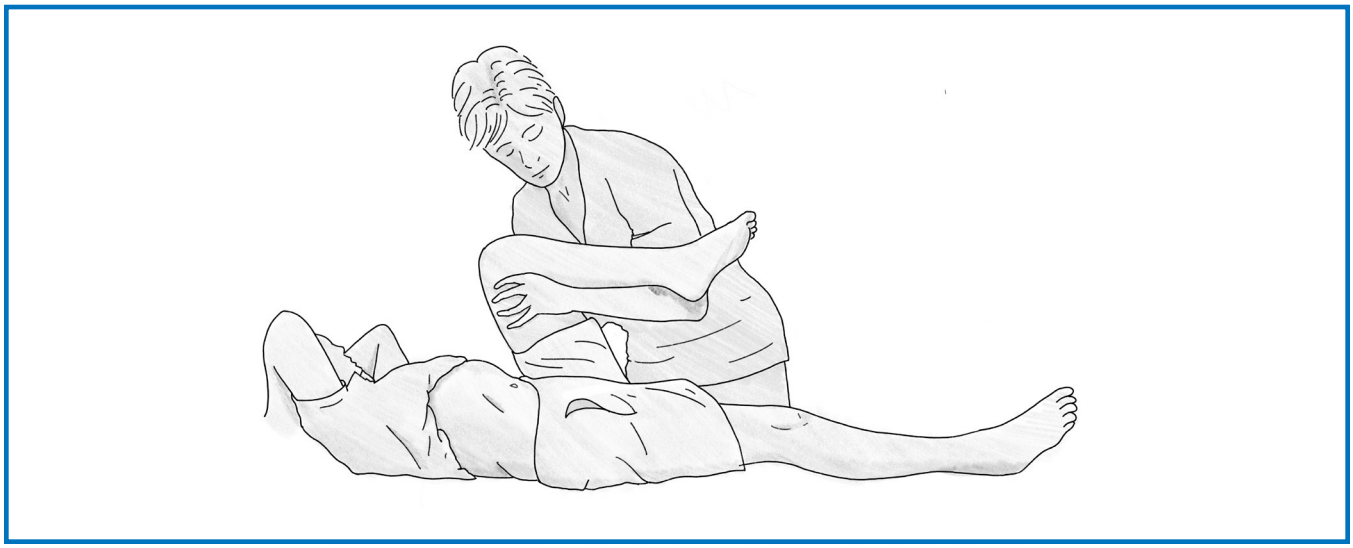


Figure 23.
Hip flexion

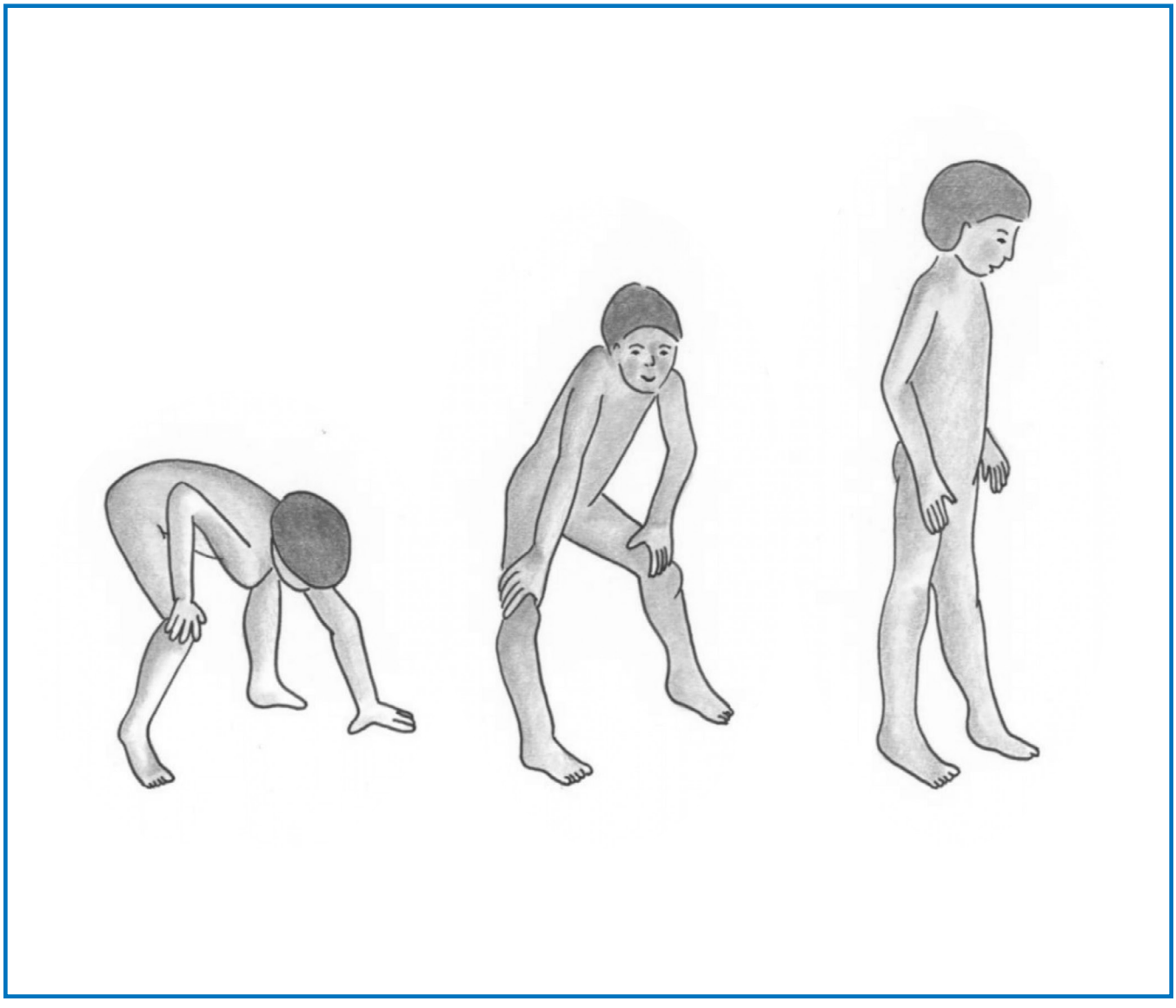


FUNCTION

Can be assessed whilst watching patient from start of consultation:

- How do they walk into clinic?
- How do they play with/use objects e.g. pencils, turning pages?
- How do they rise from chair/ground? (see figure 24)
- How do they remove clothing items for examination?

Figure 24.
Gowers's test for lower limb muscle weakness



SPECIAL TESTS

These can be performed depending on the joint involved and clinical scenario.

Measurement

- **Leg length:** A discrepancy in the presence of MSK symptoms or limp should prompt referral to the appropriate specialist team. It should be noted that some children may have a leg-length discrepancy and are symptom free. (see figure 26)
- **Thigh girth:** Again, a discrepancy in the presence of MSK symptoms can indicate an underlying related MSK disease and should also prompt referral. Examples include: quadriceps wasting due to underuse of affected limb or thigh swelling in the presence of knee arthritis on the same side.

Figure 26.
Left leg length discrepancy due to JIA affecting the left knee

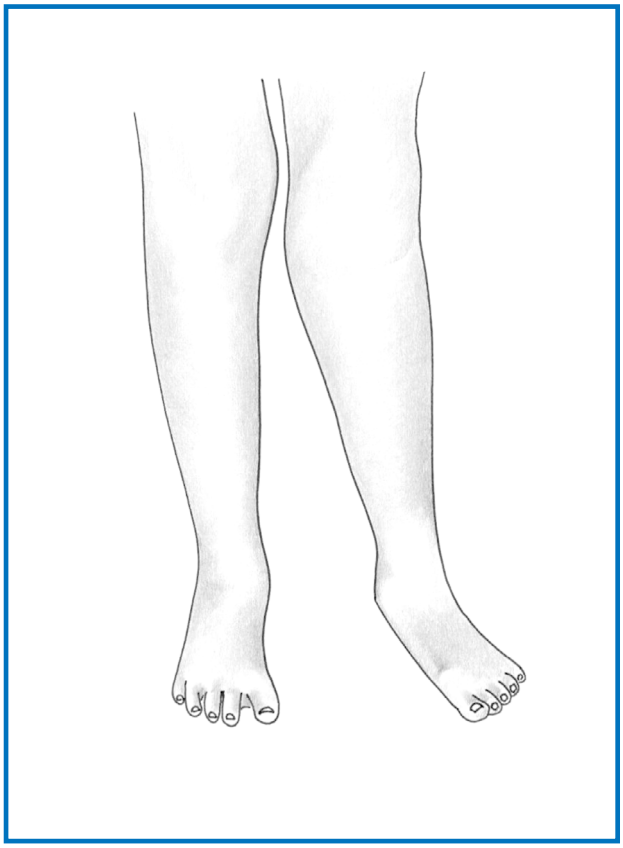
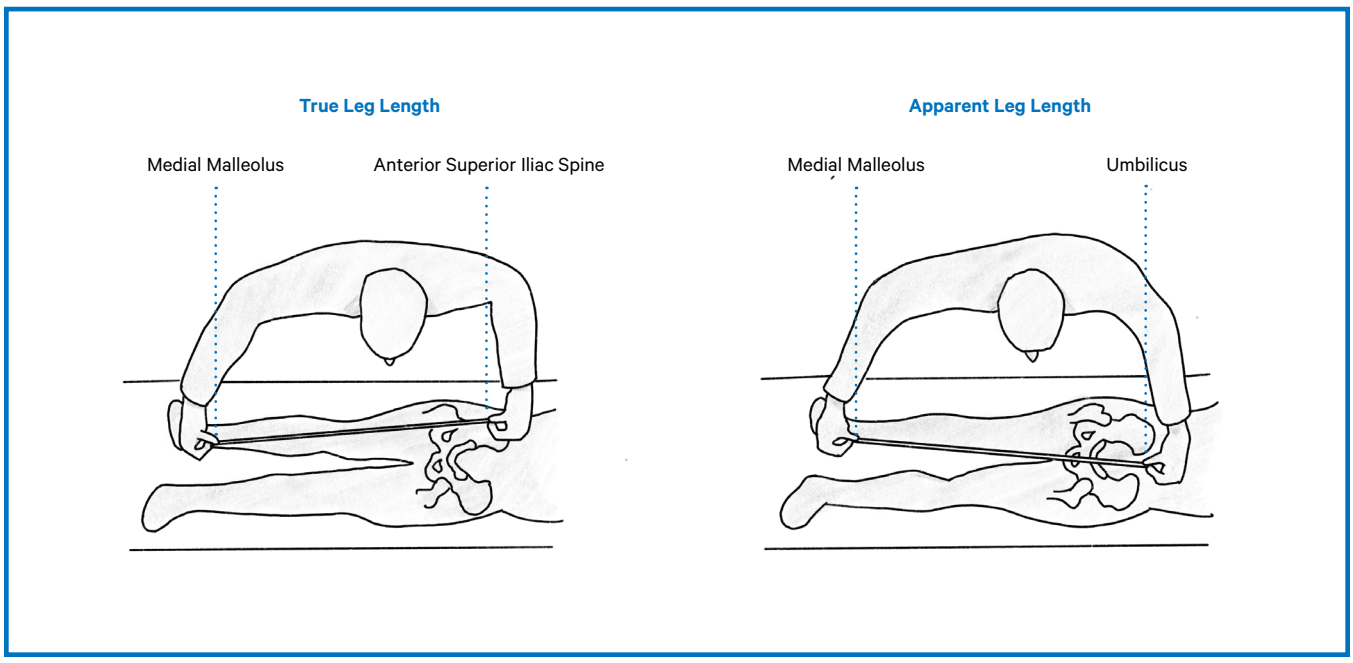


Figure 25.
Leg length measurement



Hypermobility assessment

- Hypermobility can be the reason for pain in a particular joint.
- Specifically comment on body habitus, skin elasticity, abnormal scarring, sclerae.
- Suspect Marfan's syndrome if a positive family history is present: early death from aortic dissection or other clinical features such as high-arched palate, tall stature, ectopia lentis, spontaneous pneumothorax, varicose veins or recurrent hernias.
- Suspect Ehlers–Danlos syndrome if excessive bruising, elastic skin or unusual bruising is evident.
- Hypermobility can also be found in Down's syndrome and osteogenesis imperfecta.
- Children with hypermobility can also develop inflammatory arthritis – this may be suspected with acquired loss of hypermobility/ asymmetrical changes.
- The Beighton score is used to assess hypermobility in adults; it is not validated or recommended for use in children.
- A hypermobility assessment can be found on the PMM website. Various movements as part of the assessment can be seen in figures 27–31:

Figure 27.

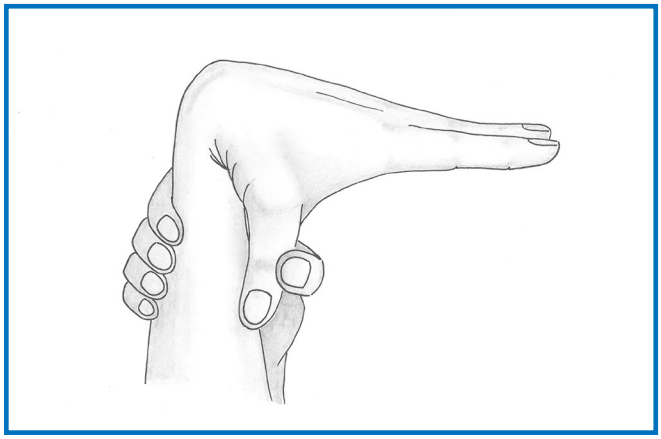


Figure 28.

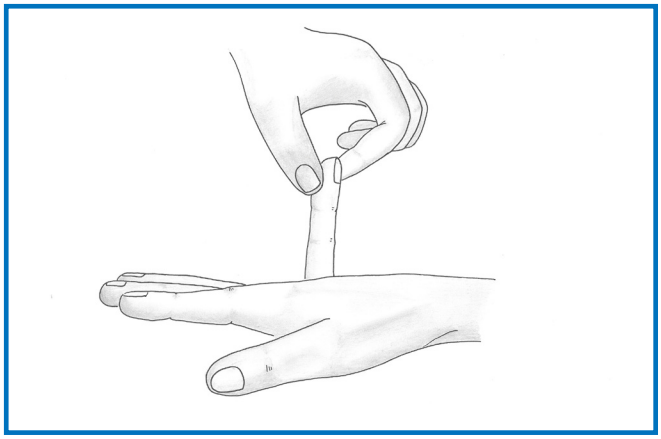


Figure 29.

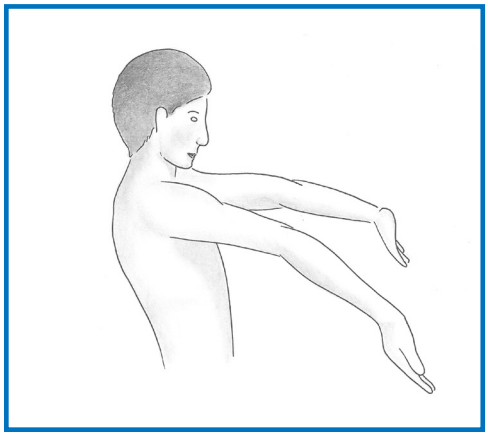


Figure 30.

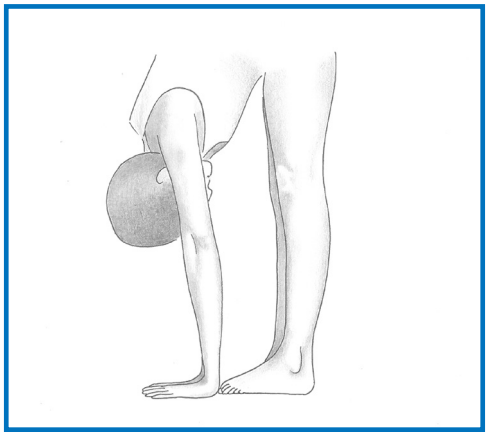


Figure 31.

SPECIAL TESTS

Nail fold capillaroscopy

- Specialist test, normally performed by the paediatric rheumatology team.
- Microscopy is used to examine the blood vessel wall structure under the nailbeds.
- Can be performed in: Raynaud's phenomenon, juvenile systemic sclerosis, juvenile dermatomyositis, SLE and those with a suspected vasculitis.

Entheses assessment

- Patient has pain surrounding a tendon insertion site. Can be observed in subtypes of JIA (enthesitis-related arthritis).
- Observe for swelling, redness of affected area.
- Perform careful palpation and movement.
- Common sites of involvement include: ankle (Achilles tendon insertion), knee (patellar tendon insertion), pelvis (adductor tendon insertion), elbow (flexor and extensor tendons). Often associated with sacroiliac joint tenderness.
- Can be further evaluated by USS/MRI of affected area.
- Further detail can be accessed on the PMM website.

Neurological assessment

- A detailed (peripheral) neurological examination may be necessary depending on the area affected.
- Tone/muscle power/reflexes/coordination/ sensation form basis.
- Lower limb neurology must always be assessed in the context of back pain.
- Additional tests include:
  - Tinel's test (median nerve irritation)
  - Gowers's test (proximal hip weakness).

Other assessments

- Peripheral pulse checks (where concerns with circulation).
- Clarke's test of the knee to detect patellofemoral dysfunction/anterior knee pain.
- Cruciate and collateral ligament testing of the knee.
- Thomas test to detect a fixed flexion deformity of the hip.
- Trendelenburg test of the hip to detect gluteal muscle weakness.
- Schober's test to detect a reduction in forward flexion of the spine.
- Straight-leg raise to test for L4, L5, S1 nerve root tension.

PATTERN OF JOINT INVOLVEMENT

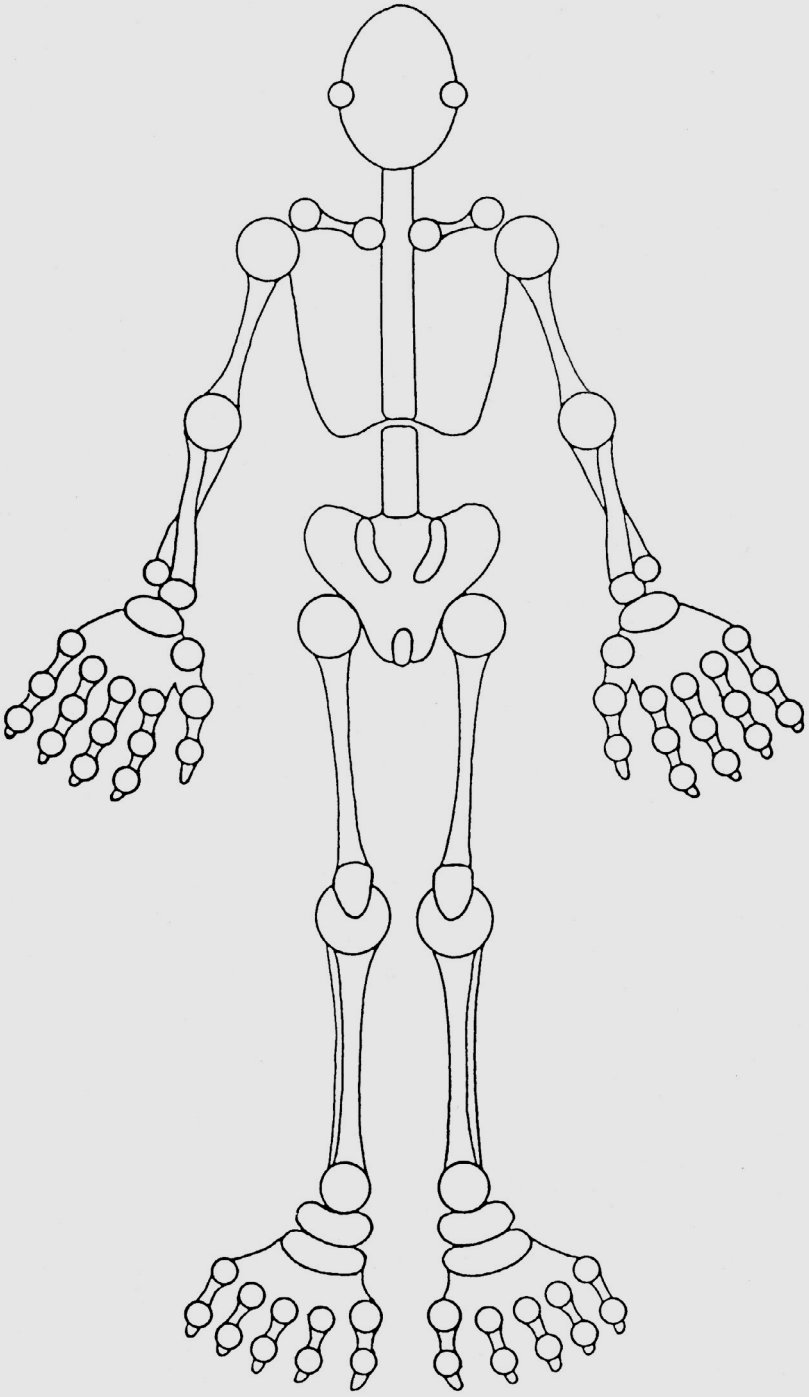
Can help in differential diagnosis and defining type of arthritis. Patterns include:

1. **Monoarticular:**
   one joint affected (e.g. septic arthritis).
2. **Oligoarticular** (or pauciarticular): **≤4** joints (e.g. oligoarticular JIA).
3. **Polyarticular: ≥5** joints affected (e.g. polyarticular JIA, SLE).
4. **Axial:**
   where the spine is predominantly affected (e.g. ankylosing spondylitis).

pREMS RECORDING PROFORMA

A downloadable PDF proforma to record findings of each pREMS can be found on the PMM website

Assessment findings can be recorded on the homunculus graphic (see figure 32)

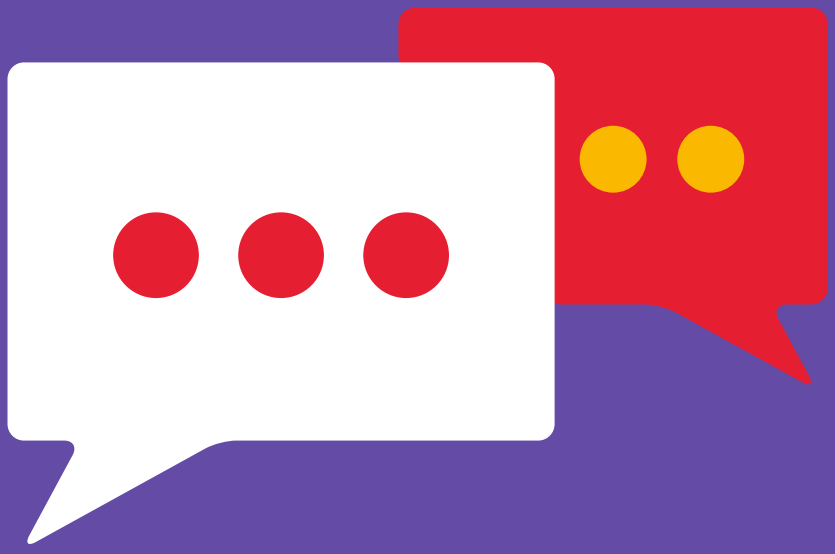


Mark affected joints

X – Swollen

O – Restricted

Figure 32.
Homunculus for annotation.



06. COMMON SCENARIOS: Q&A

48 HYPERMOBILITY
48 GROWING PAINS
49 FLAT FEET
49 RED-FLAG FEATURES
50 DELAY IN WALKING
50 INVESTIGATING SUSPECTED MSK PROBLEMS
51 ARTHRITIS IN CHILDREN WITH A LEARNING DISABILITY

HYPERMOBILITY

Q.

When children present to primary care with pain associated with hypermobility, what features would warrant a referral?

A.

Hypermobility is common within the general population. Many with hypermobility do not experience pain or significant difficulties. Symptomatic hypermobility refers to a collection of symptoms that can occur in addition to the presence of hypermobility including joint/muscle aches post-exercise/end of the day/at night, stiffness post-exercise, fatigue, poor sleep, postural problems and clicking joints. Often there is a strong family history with females affected more than males. The focus of managing these patients should include establishing realistic expectations, encouraging full function and participation in their usual activities.

A small number of patients can present with other additional features that may necessitate onward referral to an appropriate service (paediatrics, rheumatology or genetics). Additional features include skin hyperextensibility, easy bruising, skin thinning, related cardiac or ocular issues. These features in association with hypermobility can be suggestive of an inherited collagen disorder such as Ehlers–Danlos syndrome, Marfan's syndrome or osteogenesis imperfecta. Other indications for referral include persistent pain, functional limitation, asymmetrical hypermobility, suspicion of a related inflammatory joint or muscle disease.

Further information on hypermobility in children can be found on the PMM website.

Approaching a hypermobility assessment can be found on page 41 of this booklet.

GROWING PAINS

Q.

I have seen a child who I believe has growing pains. How can I reassure myself that this is the likely diagnosis rather than something more sinister?

A.

When growing pains are suspected, it is important to consider the 'rules' of growing pains, and where the presentation does not fit with this pattern, this raises the concern that there may be other pathology to account for the symptoms.

Growing pain 'rules' include:

- occurs between the ages of 3–12 years.
- symmetrical pain in lower limbs without relation to joints.
- should never cause a limp.
- pain should not be present in morning after waking.
- systemically well and have a normal physical examination with normal motor milestones.

Where there are any concerning features, options for clarifying this uncertainty include investigations and/or referral (or 'advice and guidance', where available) to paediatric services.

Further information on growing pains, the 'rules' of growing pains and a parent information leaflet can be found on the PMM website with a top tips PDF overview also available.

FLAT FEET

Q.

Up to what age is it considered normal to have flat feet in children?

A.

Flat feet are generally considered a normal variant up to age 5 or 6, but there are specific features that may suggest further assessment is needed – an overview can be found on the PMM website.

Concerning features of flat feet include: lack of arch whilst standing on tip toes, an asymmetrical flat foot, stiff or swollen joints of the feet, persistent pain or limp, evidence of abnormal neurology.

Painful flat feet in an older child should raise suspicion of tarsal coalition or of an inflammatory arthritis.

In addition, there are several other normal variants which are commonly encountered in primary care, again with specific features that may warrant further consideration.

Triaging information, normal variants and referral indications can be found through the RightPath website.

RED-FLAG FEATURES

Q.

What are the red flags for children presenting with musculoskeletal problems?

A.

The red flags are all features of a presentation that may suggest serious illness such as malignancy, infection or non-accidental injury.

As covered in the Musculoskeletal History section of this booklet, careful assessment of a child with a limp with or without a fever can be suggestive of malignancy. Similar red-flag features include weight loss, lethargy, bruising, lymphadenopathy, pallor and night pain.

An unwell-appearing child or young person with an acutely swollen, tender joint in the presence of fever should prompt urgent assessment in secondary care to exclude a serious infection such as septic arthritis or osteomyelitis.

Inconsistencies in the history with examination findings requires careful assessment for consideration of a non-accidental injury. Risk factors for non-accidental injuries include domestic violence, parental mental health issues and/or alcohol/drug abuse within the household.

Further information on red flags can be found on the PMM website.

DELAY IN WALKING

Q.

When would we expect children to start walking? At what point should referral be considered?

A.

Most children would start walking with assistance by 12–14 months. Referral would generally be considered if the child has not started walking by 18 months, if there are concerns around meeting their other motor milestones, or if other features of MSK disease are present.

An overview of normal gait pattern, motor milestones and concerning features can be found on the PMM website.

INVESTIGATING SUSPECTED MSK PROBLEMS

Q.

If I am planning on referring a patient to paediatric rheumatology to investigate for an inflammatory condition, are there any investigations I should arrange in the meantime?

A.

Where investigations can be easily performed in primary care, certain blood and urine tests can be helpful when referral is made. Information about these can be found on the PMM website.

Normal blood tests do not rule out pathology, and referral should still be made despite normal test results if clinical concerns remain. For children, invasive investigations can be traumatic and technically difficult, and so, whilst helpful, referrals can still be made without initial investigations where it is felt this would not be appropriate.

Additional information on autoantibodies can be found on the PMM website.

ARTHRITIS IN CHILDREN WITH A LEARNING DISABILITY

Q.

What are the challenges to correctly diagnosing arthritis in children with a learning disability?

A.

There is a misconception that children who have learning disabilities have a higher pain tolerance than their peers – this is not the case for most children and some may have increased sensitivity to pain.

For children with a learning disability and impaired communication ability, undiagnosed arthritis can result in behaviours that hinder diagnosis as a full clinical assessment can be challenging. As for all children with arthritis, it is important to identify and treat the condition early, not only to improve clinical outcomes, but also quality of life.

Children with Down's syndrome are at increased risk of developing inflammatory arthritis. Despite this higher prevalence, Down's Arthritis (DA) is often missed leading to a delay in diagnosis and worse clinical outcomes. A high index of suspicion is needed. Every child with DA is unique and the signs and symptoms are variable. Typical signs and symptoms observed in JIA may be absent or very subtle.

Gradual functional loss over time in a child with communication difficulties may go undetected. Children may be uncooperative and combined with poor verbal skills, this makes the history taking and MSK examination challenging. Delay in motor development is often falsely attributed to learning disability, and changes in activities of daily living attributed to behavioural problems rather than arthritis.

Some children with learning difficulties or autistic spectrum disorder have minimal language skills and difficulty using non-verbal communication, such as gestures, eye contact or facial expressions. This can make it hard for them to say when they are in pain, or to explain the location, nature and severity of that pain. Often parents or carers will learn cues to identify when their child is not well, but sometimes they too may struggle to localise the source of the problem.

Hypermobility is a feature of Down's syndrome and may make MSK examination challenging, as it may be difficult to appreciate loss of range of movement secondary to arthritis. Asymmetrical loss of joint range is a helpful clue of arthritis.

Further information can be found:

- on the PMM website: Down's syndrome.
- in the BMJ article Arthropathy of Down syndrome: an under-diagnosed inflammatory joint disease that warrants a name change.

Note: Although the term 'Down syndrome' is now widely used internationally, 'Down's syndrome' is commonly used in the UK.

07. CORE MESSAGES

MSK clinical assessment is an important general paediatric skill for all clinicians who encounter children.

Many children present with vague complaints so careful assessment is key – knowledge of what is normal is essential to pick up what is abnormal.

MSK problems can have lots of causes. However, careful assessment often indicates the underlying diagnosis.

Early diagnosis of MSK pathology can reduce and avoid disability.

pGALS is the only evidence-based approach to a joint examination in children – validated in school ages but younger ages can do it too.

pGALS takes approximately 1–2 minutes to perform and can detect a wide range of rheumatological, orthopaedic and neuromuscular issues. Practice is essential.

pREMS can be performed following pGALS of the affected joint. A number of 'special tests' can be carried out depending on the clinical context.

08. APPENDICES AND USEFUL RESOURCES

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APPENDIX 1: REVISION CHECKLISTS

History taking

Symptoms

- ☐ Pain
- ☐ Stiffness
- ☐ Swelling
- ☐ Limp
- ☐ Pattern of joint involvement

Evolution

- ☐ Acute or chronic?
- ☐ Associated events
- ☐ Response to treatment

Involvement of other systems

- ☐ Skin, eye, lung or kidney symptoms?
- ☐ Malaise, weight loss, fevers, night sweats?

Impact on patient's lifestyle

- ☐ Patient's needs/aspirations
- ☐ Behavioural changes
- ☐ Impact at school
- ☐ Limitation of activities

Focused questions for the child with a learning disability

- ☐ Regression in motor milestones?
- ☐ Change in behaviour?
- ☐ Subtle adaptations noted to perform activities?
- ☐ Change in gait or shape of fingers?

pGALS screening questions

- ☐ Any pain, swelling or stiffness in muscles, joints or back?
- ☐ Dress completely without any difficulty?
- ☐ Walk up and down stairs without any difficulty?

pGALS screening examination

Gait

- ☐ Observe walking including on tiptoes and heels
- ☐ Observe patient standing: Front, sides and back

Arms

- ☐ Hands in front, palms down, fingers outstretched
- ☐ Backs of hands, make fist
- ☐ Each finger in turn to touch thumb
- ☐ Palpate metacarpophalangeal joints
- ☐ Hands together, then back–to-back
- ☐ Reach up, 'touch the sky', 'look at ceiling'
- ☐ Hands behind neck

Legs

- ☐ Patient lying supine
- ☐ Comment on muscle bulk, leg alignment, symmetry
- ☐ Inspect soles of feet
- ☐ Palpate for an effusion at knee
- ☐ Flex and extend the knee (active and passive)
- ☐ Palpate for crepitus of the knee
- ☐ Internal rotation of hip

Spine

- ☐ Inspect spine: comment on appearance
- ☐ Place ear to shoulder
- ☐ Bend and touch toes
- ☐ Open mouth and place 3 fingers vertically within

pREMS general principles

Introduction

- ☐ Introduce
- ☐ Explanation
- ☐ Verbal consent
- ☐ Places child at ease
- ☐ Observe for pain

Look

- ☐ Scars, swelling, rashes
- ☐ Muscle wasting
- ☐ Posture, alignment of joints
- ☐ Footwear, walking aids
- ☐ Ensure appropriately exposed

Feel

- ☐ Temperature
- ☐ Swelling
- ☐ Tenderness
- ☐ Crepitus
- ☐ Muscle tone

Move

- ☐ Full range of movement – active and passive
- ☐ 'Copy me' approach
- ☐ Restriction – mild, moderate or severe?

Function

- ☐ Comment on functional assessment of joint

APPENDIX 1: REVISION CHECKLISTS

pREMS examination of the hand and wrist

- ☐ Introduce yourself/gain consent to examine
- ☐ Inspect hands (palms and backs) for muscle wasting skin and nail changes
- ☐ Check wrist for carpal tunnel release
- ☐ Feel for radial pulse, tendon thickening and bulk of thenar and hypothenar eminences
- ☐ Assess median, ulnar and radial nerve sensation
- ☐ Assess skin temperature
- ☐ Squeeze MCP joints
- ☐ Bimanually palpate swollen or painful joints, including wrists
- ☐ Look and feel along ulnar border
- ☐ Assess full finger extension and full finger tuck
- ☐ Assess wrist flexion and extension – active and passive
- ☐ Assess median and ulnar nerve power
- ☐ Assess function: grip and pinch, picking up small object
- ☐ Perform Tinel's test (if suggestion of carpal tunnel syndrome)
- ☐ Special tests: nailfold capillaroscopy, hypermobility assessment

pREMS examination of the elbow

- ☐ Introduce yourself/gain consent to examine
- ☐ Look for scars, swellings or rashes
- ☐ Assess skin temperature
- ☐ Palpate over head of radius, joint line, medial and lateral epicondyles
- ☐ Assess full flexion and extension, pronation and supination – actively and passively
- ☐ Assess function – e.g. hand to nose or mouth
- ☐ Special tests: muscle power, peripheral nerves, peripheral pulses, hypermobility, entheses

pREMS examination of the shoulder

- ☐ Introduce yourself/gain consent to examine
- ☐ Inspect shoulders from in front, from the side and from behind
- ☐ Assess skin temperature
- ☐ Palpate bony landmarks and surrounding muscles
- ☐ Assess movement and function: hands behind head, hands behind back
- ☐ Assess (actively and passively) external rotation, flexion, extension and abduction
- ☐ Observe scapular movement
- ☐ Special tests: muscle power, peripheral nerves, peripheral pulses, hypermobility

pREMS examination of the hip

- ☐ Introduce yourself/gain consent to examine

With the patient lying on couch:

- ☐ Look for flexion deformity and leg length disparity
- ☐ Check for scars
- ☐ Feel the greater trochanter for tenderness
- ☐ Assess full hip flexion, internal and external rotation
- ☐ Perform the Thomas test
- ☐ Measure leg length
- ☐ Special tests: Gowers's test, entheses, muscle power, hypermobility

With the patient standing:

- ☐ Look for gluteal muscle bulk
- ☐ Measure thigh girth
- ☐ Perform the Trendelenburg test
- ☐ Assess the patient's gait

pREMS examination of the knee

- ☐ Introduce yourself/gain consent to examine

With the patient lying on couch:

- ☐ Look from the end of the couch for varus/valgus deformity, muscle wasting, scars and swellings
- ☐ Look from the side for fixed flexion deformity
- ☐ Assess skin temperature
- ☐ With the knee slightly flexed palpate the joint line and the borders of the patella
- ☐ Feel the popliteal fossa
- ☐ Perform a patellar tap and cross fluctuation (bulge sign)
- ☐ Assess full flexion and extension (actively and passively)
- ☐ Assess stability of knee ligaments medial and lateral collateral – and perform anterior draw test
- ☐ Measure leg length, thigh girth
- ☐ Special tests: Clarke's test, patellar tracking, thigh-foot angle, hamstring and iliotibial tightness, knock-knee/bow-leg assessment, hypermobility

With the patient standing:

- ☐ Look again for varus/valgus deformity and popliteal swellings
- ☐ Assess the patient's gait

APPENDIX 1: REVISION CHECKLISTS

pREMS examination of the feet and ankle

- ☐ Introduce yourself/gain consent to examine

With the patient lying on couch:

- ☐ Look at dorsal and plantar surfaces of the foot
- ☐ Assess skin temperature
- ☐ Palpate for peripheral pulses
- ☐ Squeeze the MTP joints
- ☐ Palpate the midfoot, ankle joint line and subtalar joint
- ☐ Assess movement (actively and passively) at the subtalar joint (inversion and eversion), the big toe (dorsi- and plantar flexion), the ankle joint (dorsi- and plantar flexion) and mid-tarsal joints (passive rotation)
- ☐ Look at the patient's footwear
- ☐ Measure leg length
- ☐ Special tests: thigh-foot angle, hypermobility, entheses, muscle power, nailfold capillaroscopy

With the patient standing:

- ☐ Look at the forefoot, midfoot (foot arch) and the hindfoot
- ☐ Assess the gait cycle (heel strike, stance, toe-off)

pREMS examination of the spine

- ☐ Introduce yourself/gain consent to examine

With the patient standing:

- ☐ Inspect from the side and from behind
- ☐ Palpate the spinal processes and paraspinal muscles
- ☐ Assess movement: lumbar flexion and extension and lateral flexion; cervical flexion, extension, rotation and lateral flexion
- ☐ Special tests: one-leg standing spine extension test

With the patient sitting on couch:

- ☐ Assess thoracic rotation

With the patient lying on couch:

- ☐ Perform straight leg raising and dorsiflexion of the big toe
- ☐ Assess limb reflexes

Examination tips for children with a learning disability, especially Down's syndrome

- ☐ Be opportunistic – observe child move around the room and in play
- ☐ DA most commonly affects the small joints of the hands and wrists. Start with these joints if the child is not likely to tolerate a full examination
- ☐ Compare sides, as it may be difficult to appreciate joint restriction in a child with joint hypermobility

APPENDIX 2: DIFFERENCES BETWEEN pGALS & GALS

pGALS follows the same approach as GALS but with additions as listed in the table below. These were added as adult GALS missed significant joint abnormalities when GALS was tested on school-aged children – this likely reflects the difference in pattern of joint involvement between adults and children.

Movement	Purpose
Walk on heels and then on tiptoes	assesses feet and ankles, gives information about balance and co-ordination
Open mouth and insert three of the child's own fingers into their mouth	assesses temporomandibular joint opening and symmetry
Reach up and touch the sky	assesses full extension at the elbow joints and rotation at the shoulder joints
Look at the ceiling	assesses cervical spine extension

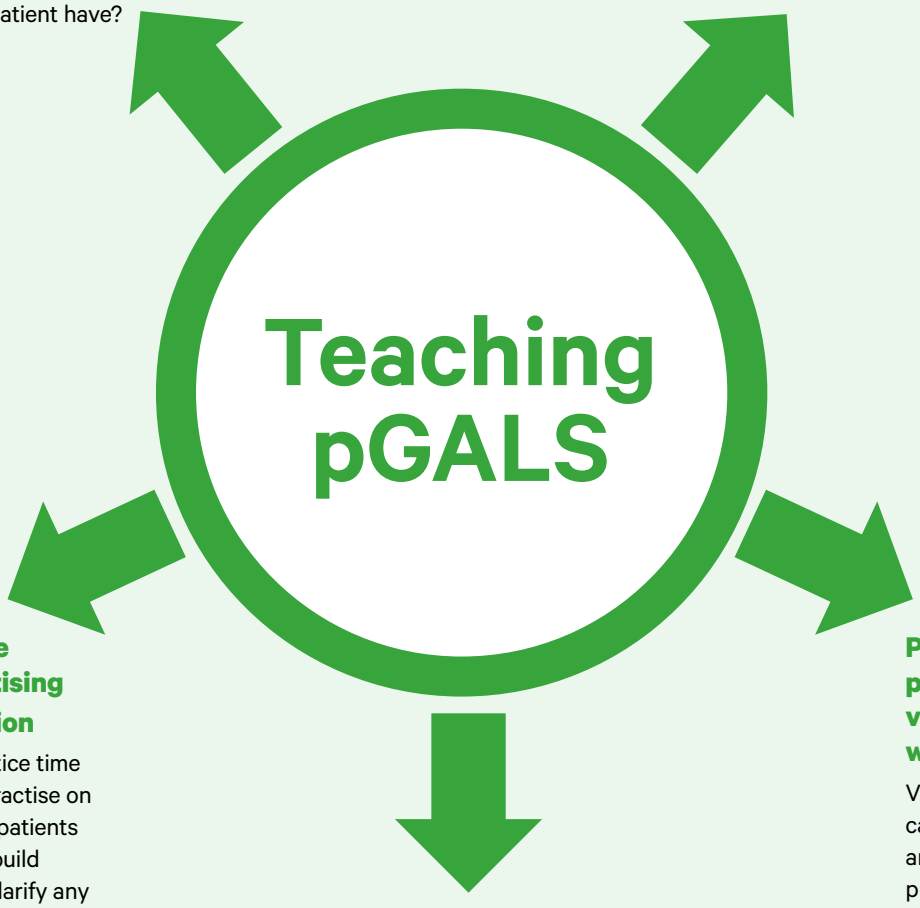
APPENDIX 3: TOP TIPS FOR TEACHING MUSCULOSKELETAL CLINICAL SKILLS

Use examples of pathology – patient images from the PMM website

Illustrate positive findings with either patients with signs or use images from the PMM website – what conditions might the patient have?

Run through in real time with students mirroring

Run through the examination, asking students to mirror your movements. Which joints are being examined with each step?



Provide ample time for practising and clarification

'Safe space' practice time for students to practise on each other or on patients or volunteers to build confidence and clarify any points they are not clear on.

If delivering remotely – ask students to watch video first and to critique pGALS

Ask student to watch the video before the session and come prepared to discuss the advantages and disadvantages. When would pGALS be indicated? Are there situations where more detailed investigations are warranted?

Provide resources – pGALS app and videos on the PMM website

Videos and pGALS app can be used as preloading and to help students practise on each other and after the session. As part of the pGALS app, a 'Test mode' allows users to practice pGALS in a timed manner, providing a pGALS checklist similar to an exam marksheet.

USEFUL RESOURCES

Paediatric Musculoskeletal Matters – website aiming to raise awareness and increase knowledge and clinical skills to facilitate early diagnosis and referral, where necessary, to specialist care

PMM app link – a study aid that takes you through the pGALS steps with explanatory notes, images and relevant links to additional information including a checklist of the pGALS steps, a revision checklist and examples of how to record the pGALS findings

NICE Clinical Knowledge Summaries on developmental rheumatology in children

RightPath – triage guidance on appropriate referrals from primary care to specialists in children and young people with a MSK issue. A useful downloadable PDF document containing triaging advice on some of the most common MSK presentations is also available

Paediatric Musculoskeletal Medicine in Primary Care – A Guide for GPs – a free short course for primary care clinicians looking to improve their assessment of MSK presentations in children and young people

Child with a fever – Rheumatology or not? – interactive module covering clinical assessment, differential diagnosis, and approach to management of a child with fever, particularly useful for paediatric trainees

Paediatric Rheumatology European Association – clinical guidelines, resources, courses and further information

Geeky Medics – OSCE-focused MSK guides and marking schemes aimed at medical students

British Society for Rheumatology – available guidelines on medication, clinical information and much more

ENDORSEMENTS

This guide is endorsed by the British Society for Rheumatology.

Rheumatology is a fun, friendly and rewarding specialty, with a strong focus on teamwork and cohesiveness across the entire multi-disciplinary team. Rheumatologists work closely with other specialties to solve difficult diagnoses and often have an active role in research; trainees have plenty of opportunities to get involved in education, clinical governance and management.

The British Society for Rheumatology is there for you from the start of your career in the specialty. We'll help you progress, collaborate and innovate to deliver the best care for your patients through a wide range of educational activity. This includes courses, conferences, webinars, podcasts, bursaries, and awards, as well as a leadership programme and clinical eLearning modules created monthly.

To find out more about how we can support you, go to www.rheumatology.org.uk/membership

JOIN THE BARBARA ANSELL NATIONAL NETWORK

Join the Barbara Ansell National Network for Adolescent Rheumatology (BANNAR)

Are you an adolescent or young adult (AYA, aged 10–24) or rheumatology professional from a health professional or third sector background?

We would be delighted for you to join BANNAR to help shape the future of clinical AYA rheumatology research.

BANNAR aims to:

- act as a focus of, and reference point for, a UK-wide network in professionals in AYA rheumatology research covering a spectrum of disease, research methods and implementation science
- provide a network across the UK to empower young people with rheumatic disease (and their families/social networks) to contribute to relevant research and help develop future research priorities
- recognise that providing the best clinical care for AYAs with rheumatic disease requires a good evidence base, but that AYA rheumatology is a neglected research area that we need to improve.

If you would like to join the BANNAR professional network, please complete the membership survey here.

If you have any questions please email the BANNAR team at BANNAR@VersusArthritis.org

BANNAR
the barbara ansell national network for adolescent rheumatology

Versus Arthritis Young People and Families Team support Your Rheum, the only dedicated group of 11–24 year-olds across the UK with diagnosed rheumatic conditions advising and shaping current adolescent and young adult rheumatology research. Your Rheum are always looking for new members and no experience is needed to join. This is a fantastic opportunity for young people to find out more about research in a supportive and fun way. Please encourage young people to get involved. If you are a researcher and interested in working with the group please get in touch: Your.Rheum@versusarthritis.org

FOR YOU...

- Join our **professional network** and become part of a growing community of healthcare professionals dedicated to improving arthritis care. We'll keep you up to date on the latest developments in musculoskeletal healthcare and share practical tips, development opportunities and resources.
- If you're looking to gain some hands-on, practical training in musculoskeletal care then check out our **training courses** for healthcare professionals. Our courses are designed to help you feel confident and knowledgeable in managing patients with MSK conditions. Our e-learning is free to access, and you can build on this with some hands-on learning at one of our practical workshops running across the UK.
- Our guide to the **Clinical assessment of patients with musculoskeletal conditions** provides a step-by-step approach to assessing people with musculoskeletal conditions. The guide and videos cover examinations of the hand and wrist, elbow, shoulder, hip, knee, foot and ankle and spine (REMS), including a step-by-step guide to the GALS screening examination.

Find out more at: **www.versusarthritis.org/about-arthritis/healthcare-professionals/**

FOR YOUR PATIENTS...

- Our **Young People and Families service** helps young people and children by offering advice on how to live well with arthritis, medication and potential treatments, as well as creating a safe space to ask questions, receive information and develop support networks.
- The **Arthritis Tracker** is a mobile app designed for young people and adults to monitor their symptoms, medication side effects, wellbeing and more.
- **Order or download patient information leaflets** free of charge.
- Encourage your patients to call the free **Versus Arthritis helpline**
- Signpost to our arthritis **virtual assistant**, a 24/7 tool that provides fast, easy to access information.
- Explore our **online community** which will connect your patients with real people who share the same everyday experiences.

Find out more at:
www.versusarthritis.org/get-help/

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