



Severn Spinal Operational
Delivery Network

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Cauda Equina Syndrome Guidelines

October 2021 v.5

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Document Purpose	Guidance
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Circulation	All Severn Spinal ODN Hospital COO's and Medical Director's Clinical Leads ED / Spinal Surgery / Radiology / MSK & Spine Triage or Interface services Chair STPs / CCG
Description	To provide a guidelines for the recognition, referral and initial management of cauda equina syndrome in the Severn Spinal Operational Delivery Network region.
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Background

Cauda equina syndrome (CES) is a surgical emergency and should be assessed, investigated, and treated as part of a clear process that reduces unwarranted delays and optimises patient care. This document aims to deliver guidance to facilitate each stage of the process and ensure patients receive the best care possible in order to reduce long-term disability. It describes the diagnosis and initial management of cauda equina syndrome and demonstrates pathways which clinicians in primary and secondary care will be able to follow.

This document does represent guidance for NHS Trusts in the Severn Regional Spinal Network (RSN) region and local adaptation will be needed to streamline processes between Trusts. It is based on information in the Spinal GIRFT report 2019, BASS/SBNS guidance, and published research.

Patients with CES can present to clinicians throughout primary and secondary care and it is essential that there is rapid access to imaging to confirm the diagnosis. The gold standard investigation is MRI scanning but the capacity for this does currently vary between NHS Trusts throughout the region. The GIRFT report highlighted significant differences in time from first presentation to MRI scan when comparing primary and secondary care and also comparing spinal and non-spinal providers.

The GIRFT report also highlights that the majority of patients with CES symptoms present in the afternoon or evening which can increase burden on MRI capacity out-of-hours.

Significant variations are present in the Severn RSN area and need to be improved in order to optimise patient care. A working party of clinicians representing most providers in the Severn RSN have discussed the current regional issues, current pathways and potential improvements which can be developed in the region, and the results are summarised in this document.

Severn Regional Spinal Network and Cauda Equina Syndrome

The Severn Regional Spinal Network (RSN) involves the spinal and non-spinal partner hospitals in the region and also links with primary care services throughout the region:

Network Sub-Group Bristol

Hub:

Southmead Hospital
Bristol Royal Hospital for Children

NHS Spinal Partners:

Gloucester Royal Infirmary
Royal United Hospital, Bath

NHS Non-spinal partners:

Bristol Royal Infirmary
Weston General Hospital

Independent spinal partners:

BMI Ridgway Hospital
Circle Hospital Bath
Nuffield Hospital Bristol
Nuffield Hospital Cheltenham
Somerset Surgical Services
Winfield Hospital Gloucester

Network Sub-Group Taunton

Hub:

Musgrove Park Hospital

NHS Non-spinal partners:

Yeovil District Hospital
Jersey

Independent spinal partners:

Nuffield Hospital Taunton

Primary Care Services

General Practitioners
Primary Care Triaging Services
Minor Injuries Units

The hub centres run an on call spinal service 24/7 and accept emergency transfers from the NHS spinal and non-spinal partner hospitals in their subgroup.

All spinal providers are able to treat cauda equina syndrome during working hours if surgeon availability allows, but any patients requiring surgery out-of-hours need to be transferred to a hub centre.

Non-spinal providers need to refer to the local hub centre for CES surgery during working hours and out-of-hours.

What is Cauda Equina Syndrome?

Cauda equina syndrome (CES) is a serious spinal condition that requires immediate assessment, investigation, and treatment. If it is unrecognised or treatment is delayed, this may result in permanent loss of bladder and bowel function, loss of sexual function, and lower limb paralysis. Patients may continue to experience ongoing severe disability despite prompt treatment but, if it is treated before symptoms become severe, this can reduce the risk of permanent disability.

CES is due to acute or rapidly progressive compression of the nerves in the lumbar or sacral spinal canal. The most common cause is a large lumbar disc prolapse but can be due to rarer causes such as trauma, infection, tumour, or spinal/epidural anaesthetic.

CES can be divided into three types, depending on the presenting symptoms:

Type	Most common symptoms	Prognosis
CES-Suspected	Bilateral radiculopathy	Risk of progression to CES-I or CES-R. Good prognosis with treatment
CES-Incomplete	Impaired perineal sensation and some sphincter disturbance. Some voluntary control is maintained	Risk of progression to CES-R. Reasonable prognosis with early treatment.
CES-Retention	Painless urinary retention and loss of sphincter function	Serious disability. Poor prognosis even with early treatment.

The presenting symptoms can be wide ranging and variable in their apparent severity. CES is a clinical constellation and not all symptoms are relevant to diagnosing CES. Some of the symptoms may be due to other causes and clinicians will need to assess each case individually.

No single symptom or sign is pathognomonic and clinicians need to have a high suspicion for CES and a low threshold for investigating it further. Over 80% of patients with these symptoms do not have CES on an MRI scan. This means an MRI is the only way to confirm if CES is present.

Potential CES symptoms may include:

1) Bladder + Bowel dysfunction:

- Painless urinary retention
- Perineal, perianal or genital sensory loss
- Difficulty initiating micturition or impaired sensation of urinary flow
- Loss of rectal filling sensation
- Laxity of the anal sphincter
- Faecal incontinence or urinary overflow incontinence

2) Limb symptoms

- Progressive or severe lower limb neurological deficit
- Bilateral sciatica (and/or back pain) [*see below*]

3) Sexual dysfunction

- Altered sexual function / Erectile dysfunction / Internal sensation changes

Sciatica does not need to be present to diagnose CES. When **bilateral sciatica** is the predominant symptom, then take the following **DISC** mnemonic into account:

1. **Duration** – if the symptoms have been present for months to years then it is unlikely to indicate CES and emergent referral is not warranted. Safety net the patient and follow the radicular pain pathway (see local guidelines).
2. **Isolated** – if the bilateral sciatica is an isolated symptom with no other features of CES (as listed above) then it is unlikely to indicate CES and emergent referral is not warranted. Safety net the patient and follow the radicular pain pathway (see local guidelines). If it is not isolated and any other feature is present, then refer into the emergency pathway.
3. **Severity** - if the symptoms are sudden and equally severe on both sides and limiting function, then the chance of CES is higher and an urgent MRI scan should be considered with appropriate safety netting.
4. **Continuation of care** these patients should not be lost in the system. They should be safety netted and flagged as potentially having a serious condition. Once an MRI has been requested it should be reviewed by the referrer on an urgent basis. If a large disc prolapse is identified compressing the cauda equina roots, then the patient should be contacted. If the patient still has no other CES symptoms then refer urgently. If CES symptoms have developed, then refer emergently.

Assessment:

- When a patient attends with symptoms of CES, they should be assessed by a clinician as an emergency. Delaying review until an available clinic slot or sitting in the waiting room for prolonged periods is not acceptable.
- Assessment will involve a history of current symptoms, duration of symptoms, and any recent progression.
- A neurological examination should be performed to identify any lower limb neurological deficit or perineal sensory deficit. Current NICE guidance states that a digital rectal examination does not need to be performed in primary care since clinicians may not be qualified to do that or not have suitable facilities and chaperone support. However, if a chaperone is available for a qualified clinician, assessing perineal sensory changes will allow monitoring of any clinical progression.
- If a bladder scanner is available, this will confirm the presence of urinary retention or incomplete bladder voiding. >200mls post-void residual is suggestive of bladder dysfunction. Incomplete voiding does not need to be present to diagnose CES and the presence of urinary retention (CES-R) is more likely to result in poorer long-term outcome than if CES is identified before retention develops (CES-S or CES-I).
- Clear documentation on timings, severity and quality of symptoms and signs is essential to allow comparison at a later date, and also to plan timing of MRI scan.
- If a patient is not deemed to have CES, clear documentation should be completed, given to the patient, and sent to the GP and interface service. The patient should be referred through normal elective channels for low back pain and radicular pain if appropriate (or urological / general surgical pathways for bladder or bowel dysfunction related to a non-spinal cause). In the presence of other significant spinal pathology such as metastatic spinal cord compression or isolated progressive radicular weakness with concordant neural compression on imaging, discussion with on call spinal services is advised to form an appropriate management plan.

- If a patient is assessed in a primary care virtual consultation and deemed to have features of CES, they do not need to be seen in a face to face clinic if this will add a delay to subsequent imaging. It is recommended that local pathways are implemented to enable an MRI scan to be arranged within the appropriate timeframe, as described below. Accurate documentation of patient-reported symptoms and signs is essential.

Imaging:

- Patients should be informed that CES is being considered and what this means. An information leaflet will reinforce verbal information provided.
- MRI scan is the modality of choice and imaging the lumbar spine will demonstrate from the lower thoracic spine down to the sacrum.
- Discussion with the on call spinal service prior to the MRI is not required and may lead to delays in performing the MRI.
- The MRI should be requested and performed in the patient's local hospital since any transfer may potentially delay diagnosis and treatment. Clinicians should document timings of assessment and MRI request, as well as any verbal discussions that are held over the timing of the scan. Keep the patient nil by mouth whilst awaiting emergency scan in case emergency surgery is required.
- If the scan confirms CES, the on call spinal service should be notified immediately. If an emergency MRI has been performed but radiology report is not available, this can be discussed with the on call spinal team to prevent any delay in potential treatment.
- If there is a contra-indication to MRI scanning, options should be discussed with the on call spinal service. A CT scan with soft tissue sequences may provide satisfactory imaging.
- If MRI is not available locally, emergency transfer to another unit must be performed. If the scan is negative for CES, immediate repatriation to the referring hospital should be expected. If scan confirms CES, patient will need to be referred to spinal on-call service from scanning hospital's emergency department.
- If there are financial constraints locally which limit MRI availability, considerations on potential medico-legal costs should be balanced against this. Funding MRI capacity to prevent delay in diagnosis is known to be cost-effective in this regard.

Timing of MRI

- Some Trusts will be able to provide MRI scans immediately for all suspected CES patients, regardless of duration and severity of symptoms. For those Trusts who cannot, the following table suggests the maximum timeframe that patients should wait for a scan.

Timings of MRI	Symptoms
Emergency	Progressive neurological CES symptoms (any duration) OR acute onset (<72hrs)
Next morning	Non-progressive CES symptoms with duration of 72hrs-2wks
Urgent (<72hrs)	Non-progressive CES symptoms with duration 2-4wks
Soon (<2 wks)	Non-progressive CES symptoms with duration >4wks

- An emergency MRI must take precedent over any routine or elective cases and be performed without delay. Any delays in this process must be documented in the patient's medical records.
- Local pathways should be developed to facilitate requesting emergency, next morning, and urgent MRI scans from both primary and secondary care, and the need to be able to access the report immediately.
- Local pathways may benefit from creating a CES co-ordinator or intermediary in the local hospital or Emergency Department to facilitate this process. A CES phone 'hotline' would maximise accessibility of this co-ordinator. A checklist would ensure scans are requested for an appropriate timeframe.
- If a patient is due to have an MRI the next day, urgently or soon as an out-patient, they should be given safety-net advice to attend the Emergency Department if there is any deterioration in symptoms.

Referral options after MRI:

Imaging Outcome	Action required
Cauda equina compression confirmed	Immediate referral to spinal service. Keep patient nil by mouth. Arrange emergency transfer (if in another hospital).
No cauda equina compression but neural compression seen to explain radicular pain.	Safety-net about progression of CES symptoms (verbal and written). If significant radicular weakness or other significant spinal pathology, discuss with spine on call about appropriate management plan. May require admission for analgesia. If discharged, will need to see GP for referral via primary care triaging services, as per National Low Back and Radicular Pain Pathway.
Non-compressive pathology(eg. Demyelination)	Referral to appropriate service (eg. Neurology / Medicine)
No cause for symptoms found	Consider whether MRI cervical and thoracic spine is required. Analgesia if required. Consider referral to other specialties (eg.continence services).

- Local pathways need to be implemented to co-ordinate appropriate timings of MRI and to action the MRI report in a timely manner.
- If a local CES co-ordinator role is created, this would involve informing the patient of the MRI result and arranging a subsequent referral plan. This should include action on any scans requested via primary care since those clinicians may no longer be on duty and further delay should be avoided if CES is confirmed.
- For MRI scans demonstrating CES, local pathways may allow the reporting radiologist to contact the local Emergency Department or CES co-ordinator to expedite patient review and referral to on call spinal services. This is particularly relevant when the MRI is requested by a primary care clinician.

Surgery:

- Timing of surgery for CES will be decided by the spinal surgical team and depends on severity and duration of symptoms, and presence of progressive neurological deterioration. Reasons for deciding this timing should be clearly documented.
- National guidance suggests proceeding with decompressive surgery at the earliest opportunity whilst considering the presenting symptoms.
- If there is any unplanned delay in commencing surgery, this should be documented clearly to explain reasons for the delay and those involved in verbal discussions about this.

Long-term management:

- Patients with CES may well have long-term disability as a result of the acute episode. This requires a multi-disciplinary approach to ensure optimum patient care.
- Patients should be referred to the local Spinal Injuries Unit (based in Salisbury) to gain input from their outreach team and potential for services in the future.
- Other services that will be required regionally and / or locally include:
 - Continence services (urology and GI surgery)
 - Clinical psychology
 - Orthotics
 - Physiotherapy
 - Sexual health advisor

Recommendations for further development

- 1) All NHS hospitals in the region should provide MRI scanning capacity 24/7 for in-patient imaging, and certainly if their Emergency Department is seeing and admitting new patients. If there are radiographer shortages, the GIRFT report suggests training all Band 6 radiographers (operating CT scanners out-of-hours) to perform basic spinal MRI imaging. A radiology report is not essential in the emergency setting and the spinal on call team will be able to confirm if CES is evident on the scan.

- 2) A pathway for primary care clinicians to arrange emergency, next day, and urgent scans should be clarified between local providers and commissioners. The use of a direct phone CES hotline, CES co-ordinator, completed form, or electronic requesting may allow patients to bypass any delays in the emergency department and attend the MRI scanner directly.
If the scan confirms CES, local pathways should be in place so the reporting radiologist can inform the local Emergency Department or CES co-ordinator in order to expedite patient assessment and referral to on call spinal services, particularly when the scan is requested via primary care pathways or performed outside normal working hours
If no report is immediately available, the role of a CES co-ordinator will allow timely discussion with the on call spinal surgical team.

- 3) Electronic MRI requesting systems can be adapted for Lumbar MRI scans to specify if CES is considered and what the timing of the scan should be. They can also include what CES symptoms are present. This will allow clearer clinical information for the radiology team and clarify when the scan should be performed. It will also allow improved governance and audit to monitor CES pathways.

- 4) To aid implementation and development of local pathways, each provider and radiology department should audit the number of cauda equina referrals they are making / receiving against the timings criteria documented in this

guidance. This will allow identification of the number of patients who could wait until the next day for their scan, rather than having it performed overnight. Once these numbers are known, appropriate funding can be discussed between commissioning groups and Trusts to allow scans to be performed during working hours when appropriate. This will reduce out-of-hours demand for MRI capacity.

- 5) Working between commissioning groups and their local hospitals to ensure MRI capacity is funded for emergency, next day, and urgent slots. This should ensure that no single hospital is expected to perform all the MRI scans and that capacity is distributed around the region. By following guidance in this document, this should reduce variation through the region and reduce delay in obtaining MRI scans.

References and Notes

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Additional notes:

The timings suggested for MRI (page 9) are based on the following evidence:

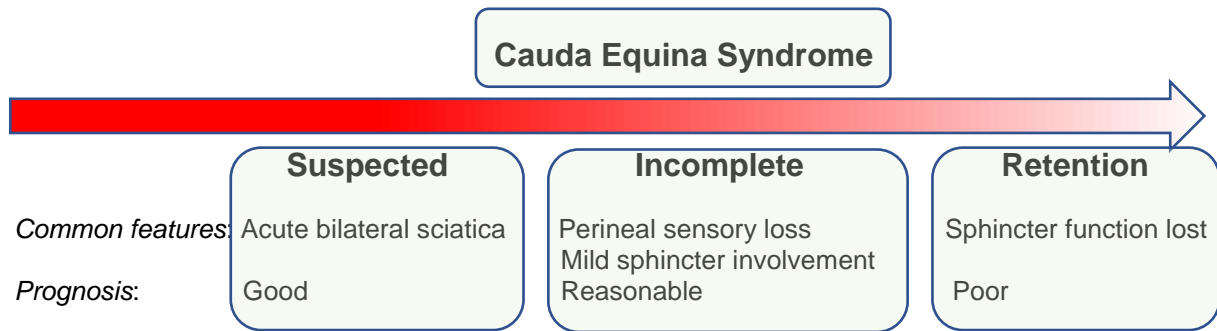
- CES-R is a severe neurological deficit and has a poor prognosis. Once a patient has had CES-R symptoms for more than 72hrs, they are unlikely to regain any function with surgical intervention.
- CES-I has the risk of progressing to CES-R. It should be treated as an emergency to prevent deterioration, especially if there is active progression of neurological symptoms. If the symptoms have been stable for more than 72hrs, the working group advise scanning the same day or the next day.
- Symptoms which have been non-progressive for over 4 weeks may be managed via elective pathways but if symptoms of CES are present, MRI is required to confirm this is suitable.

Contributors

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Appendix 1: Cauda Equina Syndrome assessment and investigation

The spectrum of Cauda Equina Syndrome:



The constellation of symptoms in Cauda Equina Syndrome:

Bladder and Bowel Dysfunction

- Perineal, perianal or genital sensory loss
- Difficulty initiating micturition
- Impaired sensation of urinary flow
- Painless urinary retention
- Urinary overflow incontinence
- Loss of rectal filling sensation
- Laxity of anal sphincter
- Faecal incontinence

Limb symptoms

- Progressive or severe lower limb neurological deficit
- Bilateral sciatica
- Unilateral sciatica
- Back pain

Features of Cauda Equina Syndrome

Sexual Dysfunction

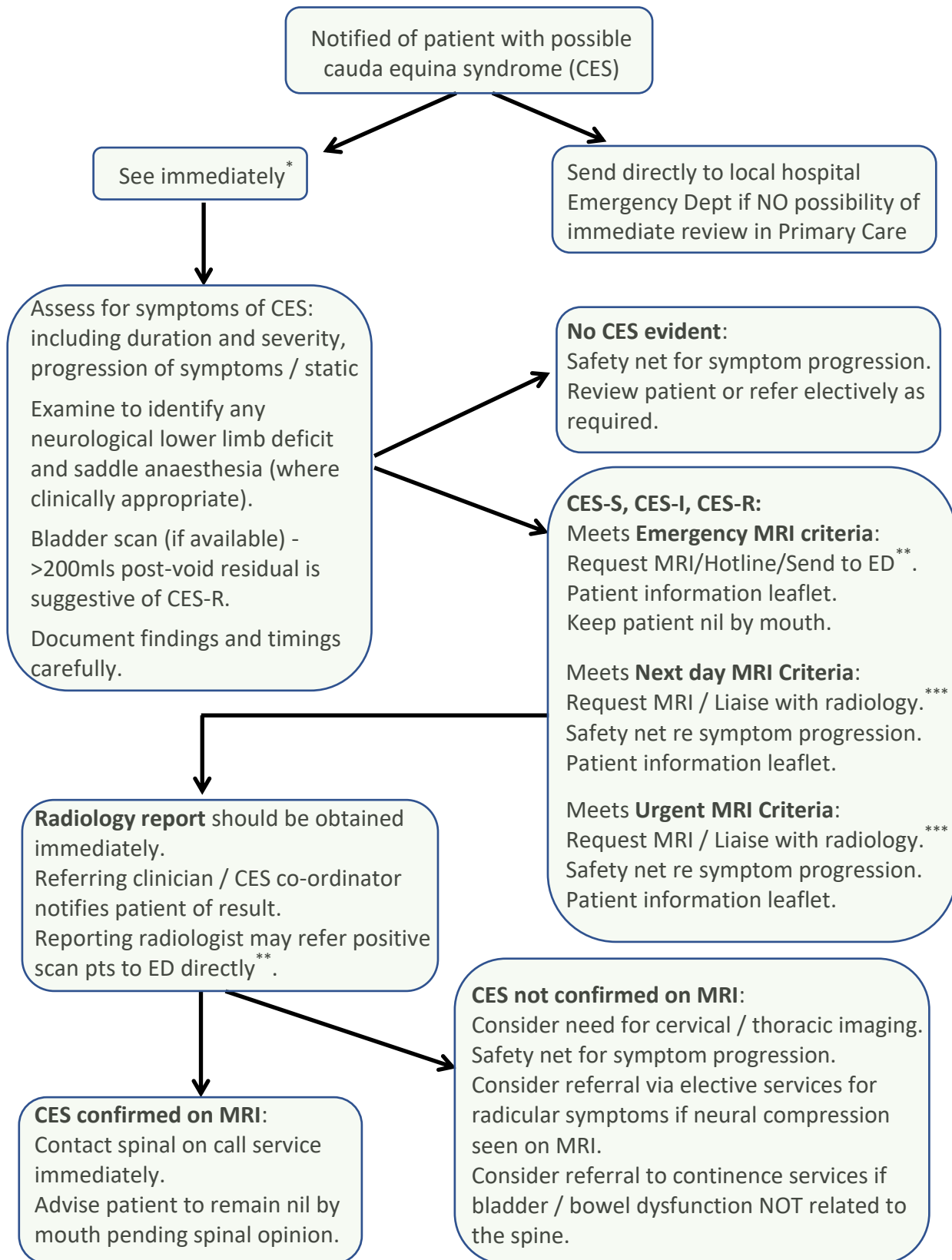
- Altered sexual function
- Deep internal sensation changes
- Erectile dysfunction

[Not all symptoms need to be present to diagnose CES]

Planning the urgency of MRI in Cauda Equina Syndrome:

Timings of MRI	Symptoms
Emergency	Progressive neurological CES symptoms (any duration) OR acute onset (<72hrs)
Next morning	Non-progressive CES symptoms with duration of 72hrs-2wks
Urgent (<72hrs)	Non-progressive CES symptoms with duration 2-4wks
Soon (<2 wks)	Non-progressive CES symptoms with duration >4wks

Appendix 2: Primary care CES pathway (GPs, MIUs, Triage services)



Requirements:

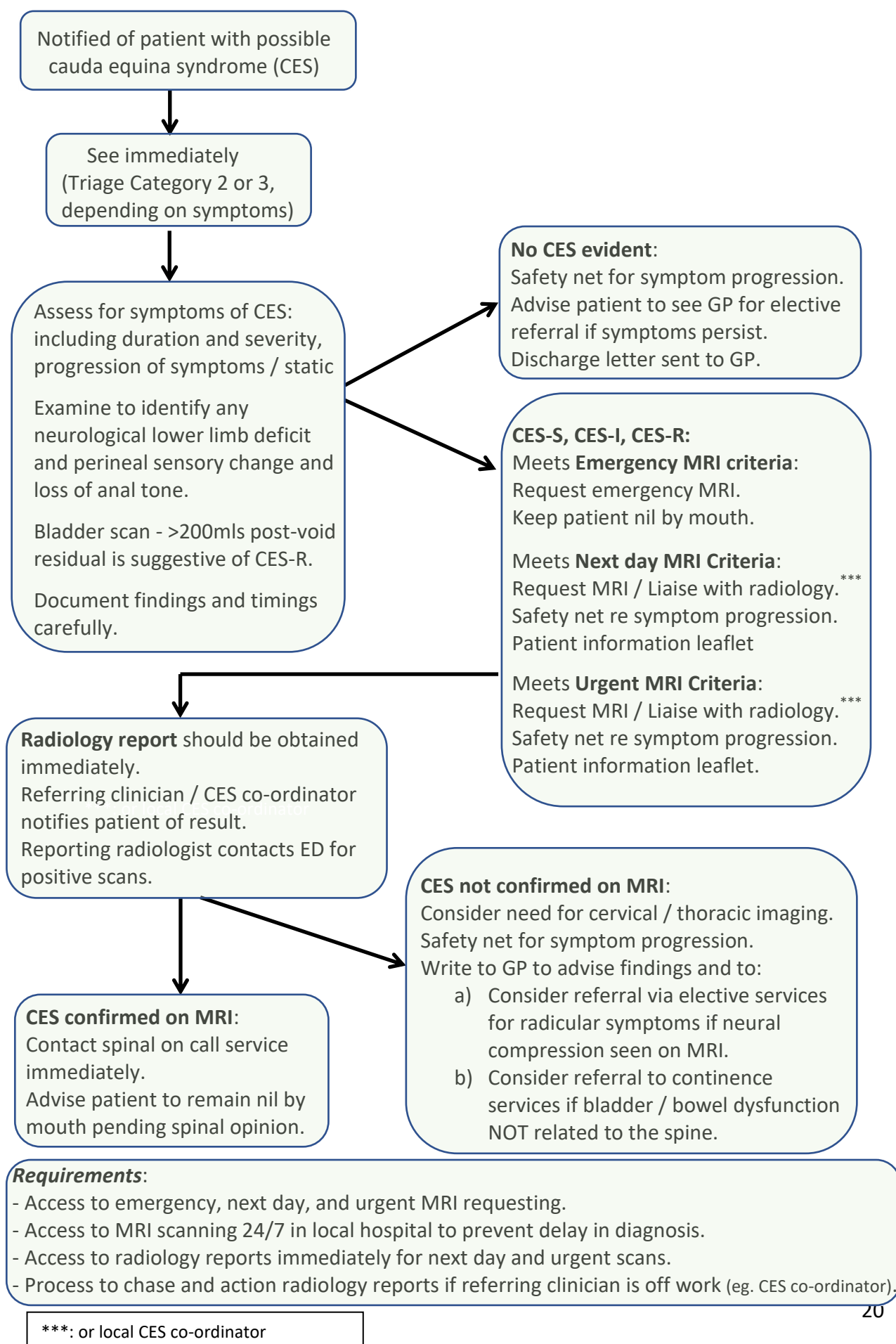
- Access to emergency, next day, and urgent MRI requesting.
- Access to radiology reports immediately.
- Process to chase and action radiology reports if referring clinician is not available (eg. CES co-ordinator)

*: please see Page 8 for information about virtual consultations

***: or local CES co-ordinator

** : local variance between different CCG agreements with Trusts

Appendix 3: Emergency Department CES pathway



Appendix 4: In-patient CES pathway

