SCHEDULE 2 – THE SERVICES

A. Service Specifications

1. Service name	Cystinosis diagnosis and co-ordination of management (all ages)
2. Service specification number	1640 - 230801
3. Date published	August 2023
4. Accountable Commissioner	NHS England - Internal Medicine Programme of Care england.npoc-internalmedicine@nhs.net

5.	**Population and/or geography to be served**
5.1	**Population Covered** The scope of this service is all adults and children in England with a diagnosis of cystinosis. The service outlined in this specification is for patients ordinarily resident in England. Commissioning arrangements for the devolved nations in relation to this service are as set out in "UK-wide Commissioning Arrangements of Highly Specialised Services: https://www.england.nhs.uk/publication/nhs-providers-of-highly-specialised-services/
5.2	**Minimum population size** NHS England is both the accountable commissioner and responsible for commissioning this service in line with the need for some specialised services to be commissioned on a central footprint due to their smaller patient populations, financial risk and volatility and/or more complex service delivery.
6.	**Service aims and outcomes**
6.1	**Service aims** NHS England commissions diagnostic and treatment services for Cystinosis, this includes outpatient services in the highly specialised service and services delivered on an outreach basis delivered as part of a provider network Effective management of patients with cystinosis is complex and involves the provision of comprehensive care by a team of health care professionals with diverse and complementary skills. Effective drug therapy and renal transplantation allows survival into the fifth decade. Access to these services will be offered to all adults and children in England with a diagnosis or suspected diagnosis of cystinosis. Cystinosis is a recessively inherited metabolic disease characterized by an accumulation of cystine within the

	lysosome compartment of cells, causing damage to many organs and tissues, including the kidneys and eyes. It is estimated that cystinosis occurs in between 1 in 100,000 to 1 in 200,000 live births. There are 2 or 3 new cases of cystinosis diagnosed each year in the UK. The disease is pan-ethnic without a pattern of geographic distribution within the UK. However, as a recessive trait, the disease is more common in communities with a high incidence of consanguinity.
6.2	**Outcomes** NHS Outcomes Framework Domains & Indicators

Domain 1	Preventing people from dying prematurely
Domain 2	Enhancing quality of life for people with long-term conditions
Domain 3	Helping people to recover from episodes of ill-health or following injury
Domain 4	Ensuring people have a positive experience of care
Domain 5	Treating and caring for people in safe environment and protecting them from avoidable harm

Service defined outcomes/outputs

Indicator	Numerator	Denominator
% of patients whose Health-related quality of life (EQ-5DY) score remained same/improved (Adult)	Number of patients whose QoL score remained the same / improved	Number of patients known to the service more than a year
% of patients whose Health-related quality of life (CHU9D) score remained same/improved (Children)	Number of patients whose QoL score remained the same / improved	Number of patients known to the service more than a year
% of patients achieving expected growth, as defined as weight of +/- 3SD (Children)	Number of patients who achieved expected growth	Number of patients under follow up
% of patients who are receiving cysteine depletion therapy (adult / children)	Number of patients on cysteine depletion therapy	Number of patients under follow up
Average time to diagnosis	Total number of days from presentation of symptoms to clinical diagnosis	Number of patients newly diagnosed in cohort in the period
Average time to renal replacement therapy	Total number of days to renal replacement therapy for patients with kidney failure	Number of patients starting RRT in cohort in the period

7.	Service description
7.1	**Service model** The service model balances the needs of Service Users to receive local care with the need for regular visits to highly specialised service (HSS) clinics. The service model addresses the need for appropriate transition with well organised, multidisciplinary pathways for Service Users to transfer from paediatric to adult care. A service should provide a minimum of an annual multi-disciplinary review at the highly specialised centre via a “one-stop” service. The HSS will ensure coordination and interpretation of investigations and make recommendations across the patient pathway, with all appointments for relevant assessment investigations arranged in advance. The HSS will complement and support the care that is delivered locally and avoid repetition of investigations unnecessarily. The Provider will offer comprehensive assessments and provide recommendations for care. This will include the following: • Promote equity of access allowing everyone with cystinosis to follow a comprehensive disease care pathway, providing high quality, holistic services for every individual through integrated personal care plans. • Facilitate a patient centred, coordinated approach to investigation, treatment, specialist healthcare and social care support, where necessary. This will consider the needs of patients, their families and others who provide essential support. • Deliver evidence-based management developed through the best use of educational resources that are easily accessible by patients and professionals. • Provide expert, high quality, clinical care and expertise to patients their families and carers through a multi-professional health care team. • Promote excellence in research to advance our understanding of cystinosis and its treatment. • Support education and training programmes that enable health and social care professionals to better identify rare diseases helping deliver faster diagnosis and access to treatment pathways for patients. • The service will collect and use data for audit purposes, sharing results and action plans with all involved with the pathways. • Working in partnership with patient organisations • Provide online access to investigation results, clinical letters and patient information through a patient accessible online portal. The best outcomes for patients with cystinosis are achieved through early diagnosis, early and sustained optimal medical management together with multidisciplinary input. In particular, the early optimal administration of cysteamine has been shown to delay the onset of complications such as renal failure, thyroid disease and diabetes. The service link to a metabolic laboratory responsible for the measurement of white blood cell cystine. Establishing a hub and spoke model will allow planned batching and timely assays.

7.2	**Pathways** Referral pathways will be established between the HSS and local renal centres to ensure that both services are made aware of patients after the diagnosis is made and work together to support the care of patients. Written, individualised, transition plan pathways will be used. Management plans will need to be developed that include the following service speciality elements of care: **Paediatric Cystinosis Services** Shared care arrangements using nationally standardised protocols will be established with the patient's local renal centre, which will deliver routine children's care with the benefit of easy access and communication with the HSS paediatric cystinosis service. Paediatric services will provide: • Assistance with the diagnosis of cystinosis • Help with access to specialised treatment therapies • Support and advise on management of the renal Fanconi syndrome • Advice on nutrition, growth and development • Support for the management of chronic kidney disease • Support for the initiation of renal replacement therapy • Assistance with the provision of information and education for patients, families / carers and health care professionals • Access to a full range of specialised children's services • Access to specialised clinical research studies • Assistance with the transition of patients from paediatric to adult care • Data entry into the appropriate registry • MDT review of patients every 6 or 12 months as appropriate **Adult Cystinosis Services** Adults with cystinosis require access to many of the services available in the paediatric service; however, kidney disease is typically more advanced in adults. Many adults will have established kidney failure and require renal replacement therapy by dialysis or transplantation. Significant numbers of patients survive into adulthood with relatively well-preserved renal function and continuing renal Fanconi syndrome. Routine care for chronic kidney disease, including renal replacement therapy, will be provided by local nephrology services. Adult services will focus on all aspects of Cystinosis; • MDT review of patients every 6 or 12 months as appropriate • Continuation of therapy • Monitoring of therapy • Management of the multisystem complications associated with Cystinosis. • Specific advice on treatment • Access to specialised clinical research studies • Managing Fanconi syndrome and supporting local services for chronic renal failure and end stage renal disease

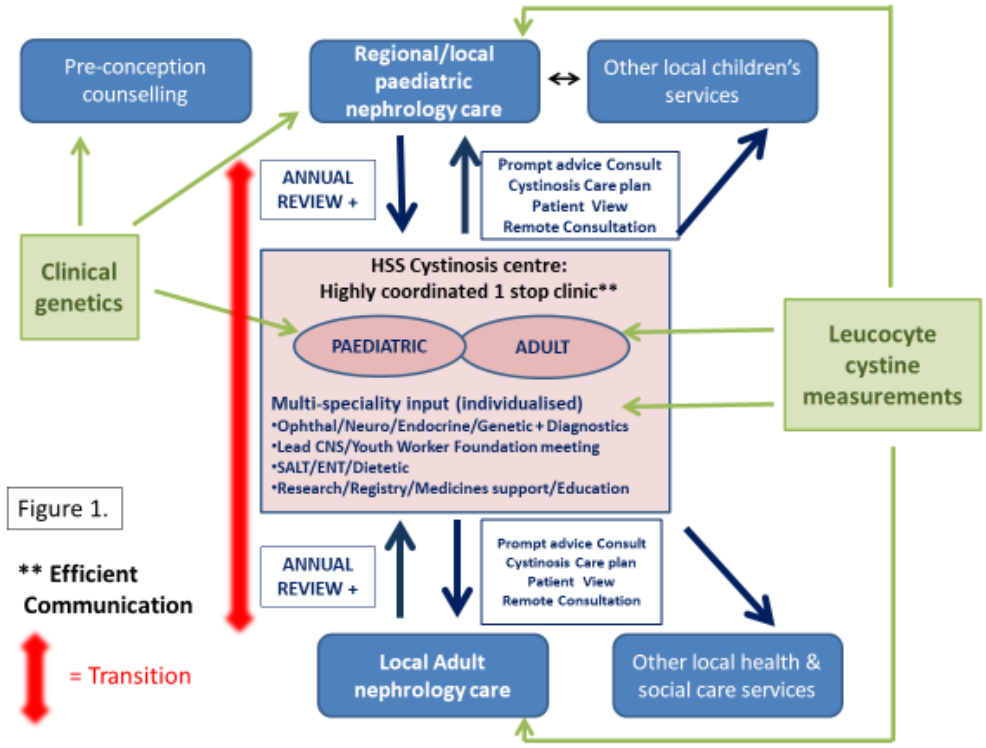

Figure 1.

Specialised patient pathway

Individuals living with cystinosis need expertise from several specialists, making a multidisciplinary and coordinated team approach important for patients. Well-coordinated care is essential when several specialists and hospital departments are involved in a patient's care.

Shared care arrangements

Services will provide coordinated care to and act as hubs in a system of care including specialist services, local hospitals, primary and community care services providing consistently excellent services and delivering most care close to patient's homes. Expert centres will reduce delays in treatment and / or prevent severe complications including endocrine, chronic kidney disease, respiratory disease and neurological function. Patients will however develop renal failure and require dialysis and/or renal transplantation. Nearly all patients will develop corneal disease and other eye problems as well as a significant number developing diabetes and hypothyroidism. Other complications include male infertility, bone disease, neurocognitive dysfunction, myopathy, respiratory compromise and difficulties in swallowing requiring a multi-disciplinary approach to overall management.

Transition Management Plans

Transition from paediatric to adult services is a major event for people with cystinosis and there will be appropriate and timely systems in place to facilitate this.

	Transition will need to occur between the local paediatric service to the local adult service (e.g., paediatric transplant clinic to adult transplant clinic). In parallel with this, the adult cystinosis service will assume the supporting role from the paediatric cystinosis service and maintain oversight of the process to ensure the specialist support is patient centred and enables patient choice for young adults (age 18-25). This will include those who are in the process of transferring from paediatrics or those who have already transferred. Arrangements for transition to adult services will be considered from the age of 13 and will normally be completed by the age of 18. In liaison with local providers, the Cystinosis service will develop written transition plans and pathways for each patient. The transition will involve a period of joint care from paediatric and adult services, and it is important for MDTs to offer care that recognises that this group may have additional development needs, including educational and employment. The following should be put in place: • Early discussion with the patient and family/carers about transition • Notification to the adult centre of intention to proceed with transition • Copies of letters and previous review reports • At least two clinics will be held at the adult site according to patient needs The paediatric cystinosis service will be responsible for ensuring relevant services have transitioned appropriately. **Links to an Accredited Laboratory that specialise in Cystinosis relevant diagnostic and management (White Cell Cystine Measurement)** The Provider will ensure that all relevant diagnostic and management evaluations are carried out within the guidelines and protocols provided by fully accredited laboratories. The genetic testing associated with this service should be undertaken in line with the NHS England National Genomic Testing Directory for rare and inherited disease. **Nephrology Services** The Provider will develop detailed care pathways across paediatric and adult nephrology care for diagnosis and monitoring of relevant care processes associated with the disease, in line with national / local evidence recommendations. **Transplant and dialysis patients:** Patients with transplants and on dialysis will usually be managed by their local renal centre. The cystinosis service will offer support and advice from physicians experienced in issues specific to cystinosis. The Cystinosis Service will offer support and advice for management plans regarding choice & access to various forms of renal replacement coordination. **Ophthalmology Services** Ocular involvement in cystinosis is usually the first major complication to develop and without pro-active management can lead to photophobia, blepharospasm, and ultimately to severe pain and impaired vision. There is a known risk of raised intracranial pressure in nephropathic cystinosis, which may present first with papilledema. Providers will need to provide an integrated ophthalmology pathway

that offers annual review and co-ordination of regular eye screening and management.

In older patients less common eye conditions can occur, facilities will allow for accurate detection and management: Some of the complications of cystinosis can have other causes and so may need access to tests used by a specialised ophthalmology service such as retinal angiography and specialist optometry services.

Neurology Services

For adult patients with cystinosis access to support from a Neurologist with expertise in the care of patients with cystinosis is essential. Cystine accumulates in cells throughout the body and causes progressive damage to the brain, multiple organs, including widespread muscle weakness.

In the paediatric population there is evidence of neuro-cognitive involvement.

- Patients should have access to appropriately experienced paediatric neurologist.
- Cognitive function needs to be tested at regular intervals and this will need access to appropriate paediatric psychology services.

Cystinosis can involve the muscles that are used to breathe leading to sleep apnoea, breathlessness and respiratory failure. To diagnose these serious conditions patients will need access to either a neurologist with a special interest in neuro-respiratory problems or another physician (such as a chest physician) with similar expertise.

Speech and Language Services

Provision of speech and language services is essential. Speech and language care for individuals with cystinosis may be linked with neuromotor dysfunction making feeding and swallowing difficult.

Nutrition and Dietetics Services

Nutritional issues occur throughout the life of a cystinotic patient. The provision of nutrition and dietetics services is essential. In addition, patients will have access to telephone advice and literature as clinically required and diabetic advice when required.

Endocrinology Services

All patients with cystinosis will have access to expert comprehensive endocrine care relevant to cystinosis and its complications.

Thyroid

Thyroid complications may occur in a significant number of patients. Thyroxine replacement should be provided and monitored locally with advice from the specialist centre.

Bone

In paediatric practice bone problems are caused by the loss of calcium and phosphate in the urine along with other ions as a result of Fanconi syndrome together with a decreased activation of vitamin D. In older patients or those with advanced renal disease or receiving dialysis the situation is more complex and is

known as renal osteodystrophy. Renal osteodystrophy management will be in accordance with published guidelines.

- Access to a laboratory able to measure PTH and vitamin D as well as routine tests will be provided.
- Complex renal bone disease will be managed by renal physicians and others experienced in such problems and they may need access to more specialised investigations.

Sexual function and fertility treatment & Special Obstetric Advice Service

Woman may have delayed menarche, but this rarely needs any specialist advice however they will need access to obstetricians experienced in the management of medical problems in pregnant patients. Men may be infertile depending on the Cystinosis diagnosis and may also be testosterone deficient. Identification of testosterone deficiency and signposting of advice on management is key. Testosterone replacement monitoring may be managed locally with collaboration with the specialist centre

Genetics & Laboratory Investigation Services

As cystinosis is a genetic disease both patients and parents will need appropriate genetic advice. The Provider will incorporate the following into their pathways:

• Specific lab tests (measurement of white cell cystine)

• Genetic diagnosis

• Genetic Counselling from an appropriately trained counsellor and/or a geneticist.

Medicines Management

The use of cysteamine can be associated with certain problems that can be addressed by a pharmacist experienced in cystinosis and its treatment. The Provider will have a medicines management procedure in place. Service Users will receive a regular scheduled formal medicines management review, this should be done routinely whenever a patient changes clinical location for their care.

Care Co-ordinator/Clinical Nurse Specialist (CNS)

A designated, named clinician should be identified as care coordinator for each patient who is responsible for ensuring the delivery of coordinated care according to the hub and spoke arrangement for that patient. CNSs will be supported by the wider MDT and will establish a national network to ensure consistent protocols and support.

Named Consultant

Each patient should have a named Consultant at the hub centre who is accountable for the delivery of hub services for that patient.

Psychology Services

Patients with cystinosis frequently have a variety of psychological problems related to their disease and its complications. This can significantly affect their quality of life and prevent them from maximising their educational potential, gaining employment, integrating into society, and developing significant relationships. While many of these problems are common to patients with chronic long-term conditions and renal failure, some will be directly related to their cystinosis. The

<table>
<tr><td></td><td>Provider will ensure that patients have access to appropriate psychology services and that the initial assessment will be by a professional who has knowledge of cystinosis and its complications.

Patient Support Groups

Patient support groups play an important role in providing patient information and education. The Providers are expected to work closely with patient groups to help produce educational material, participate in face-to-face educational activities and peer-to-peer meetings, and generally increase awareness of Cystinosis and the issues that patients experience. Providers will ensure relevant patient organisations are involved in all relevant educational initiatives and activities. Providers will ensure that relevant information, together with appropriate contact details and sources of further information, such as web links, is available at all clinics.</td></tr>
<tr><td>7.3</td><td>Clinical Networks

HSS providers will be required to establish a networked model of care to enable services to be delivered as part of a co-ordinated, combined whole system of care including specialist services, local hospitals and primary and community care services providing expert services and delivering care close to patients’ homes where possible.</td></tr>
<tr><td>7.4</td><td>Essential Staff Groups

The multisystem nature of cystinosis means that as well as life-long kidney care, there must be access to specialists with specific expertise in the non-renal complications of cystinosis. Providers will ensure that access in a “one stop” multidisciplinary clinic, annually or more frequently if indicated / needed, offering clinical consultations and all necessary investigations. Additional access to those specialists will be provided as required between annual reviews.

Each patient’s comprehensive care plan will detail their requirements and the clinics will be responsive to changing needs. The required expertise needs to be available as part of the MDT as specified:

<table>
<tr><th>MDT Specialist Expertise</th><th>Paediatrics</th><th>Adults</th></tr>
<tr><td>Clinical genetics – Diagnostic</td><td>Essential</td><td>As necessary</td></tr>
<tr><td>Pregnancy / Counselling</td><td>As necessary</td><td>As necessary</td></tr>
<tr><td>Pharmacy - overseeing access to specialised therapies</td><td>Essential</td><td>Essential</td></tr>
<tr><td>Nutritional Support</td><td>Essential</td><td>As necessary</td></tr>
<tr><td>Growth & Development</td><td>Essential</td><td>-</td></tr>
<tr><td>Ophthalmic</td><td>Essential</td><td>Essential</td></tr>
<tr><td>Gastro-intestinal</td><td>As necessary</td><td>As necessary</td></tr>
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		Neurological & Neuromuscular (include respiratory function)	As necessary	Essential
		Physiotherapy	As necessary	Essential
		Speech & Language therapy	Essential	Essential
		Endocrine	Essential	As necessary
		Cardiac	As necessary	As necessary
		Reproductive health	-	As necessary
		Psychological support	Essential	Essential

7.5 **Essential equipment and/or facilities**

Technology & Facilities

The Provider will need to develop systems to support the cystinosis centre approach and technology (equipment) and facilities that will promote improved care for patients with cystinosis. The Provider may use Telecare / Telemedicine technology to coordinate pathways with locally provided services. Patients and their families will have access to Patient View or equivalent with comprehensive care plans uploaded to this system creating an “electronic patient passport”.

Laboratory Investigation Services

Access to laboratory services for measurement of white cell cystine.

7.6 **Interdependent Service Components – Links with other NHS services**
Dermatology Services

Access to dermatology advice may be needed. These services can be delivered locally.

7.7 **Additional requirements**

Information System

The Provider will submit data to the UK Renal Registry of the Renal Association and its Rare Disease Registry (RADAR) for comparative audit purposes, and other local requirements set out by the commissioner of the service. Clinical audit information should be made available to patients in an accessible format. The electronic record in the renal information systems will enable data fields in the registry to be completed.

The Provider will also ensure that the required patient activity and outcomes data is provided in accordance with the requirements of the UK Renal Registry.

Each Provider must assure that:

i. All practitioners participate in continuous professional development and networking
ii. Patient outcome data is recorded and audited across the service
iii. They participate in annual clinical meetings

	Annual Clinical Meetings should address: i. Clinical performance and outcomes ii. Process-related indicators e.g. efficiency of the assessment process, prescribing policy, bed provision and occupancy, outpatient follow-up etc. **iii.** Stakeholder satisfaction, including feedback from patients, their families, referring clinician and GPs.
7.8	**Commissioned providers** Manchester University Foundation Trust (all ages) Guy's and St Thomas's Foundation Trust (all ages) University Hospitals Birmingham NHS Foundation Trust (adults) Birmingham Women's and Children's NHS Foundation Trust (paediatrics)

7.9	Links to other key documents Due to the large number of specialities involved in the care for patients living with cystinosis, multiple Clinical Guidelines and Best Practice Protocols will need to be adopted by the Cystinosis centres. • NICE guideline NG43 Transition from children's to adults' services for young people using health or social care services https://www.nice.org.uk/guidance/ng43 • National service framework: kidney disease https://www.gov.uk/government/publications/national-service-framework-kidney-disease • NICE Guidance NG203: Chronic kidney disease: assessment and management https://www.nice.org.uk/guidance/ng203 • NICE Guidance NG107 Renal Replacement therapy and conservative management https://www.nice.org.uk/guidance/ng107 • UK Kidney Association: Information on Rare Renal Diseases http://rarerenal.org/raredisease-groups/cystinosis-rdg/ • UK Strategy for Rare Disease https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/260562/UK_Strategy_for_Rare_Diseases.pdf • End of Life Care in Advanced Kidney Disease http://www.ncpc.org.uk/sites/default/files/EndOfLifeCareInAdvancedKidneyDisease.pdf • Nephropathic cystinosis: an international consensus document. http://europepmc.org/articles/pmc4158338 • KDIGO Guidelines https://kdigo.org/guidelines/ • The Renal Association: Clinical Practice Guidelines https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries • British Transplantation Society Guidelines https://bts.org.uk/guidelines-standards/ • Standards for the investigation of respiratory complications of muscle disease [Qaseem A et al. Management of Obstructive Sleep Apnoea in Adults: A Clinical Practice Guideline from the American College of Physicians. Ann Intern Med 2013: 159:471-483] and a standard scoring system. DOI: 10.7326/0003-4819-159-7-201310010-00704 • Garber J R et al ATA/AACE Guidelines in Hypothyroidism in Adults. DOI: 10.4158/EP12280.GL • NICE Guidance NG17 Type 1 diabetes in adults: diagnosis and management. https://www.nice.org.uk/guidance/ng17 • NICE Guidance NG28 Type 2 diabetes in adults: management https://www.nice.org.uk/guidance/ng28 • NICE Guidance NG18 diabetes in children and young people https://www.nice.org.uk/guidance/ng18 https://www.england.nhs.uk/publication/national-genomic-test-directories/: https://www.england.nhs.uk/genomics/genomic-laboratory-hubs/

Change form for published Specifications and Products developed by Clinical Reference Group (CRGs)

Product name: Cystinosis diagnosis and co-ordination of management (all ages)

Publication number: 1640 - 230801

CRG Lead: Commissioning Manager, Highly Specialised Services

Description of changes required

Describe what was stated in original document	Describe new text in the document	Section/Paragraph to which changes apply	Describe why document change required	Changes made by	Date change made
The original specification was newly published but following the procurement process that completed Q3 22/23 the specification has been updated into the new template		Broadly similar text into new template	New template	Sarah Watson	August 2023
Neurological & Neuromuscular (include respiratory function) expertise in the spec essential for paediatric MDT	Neurological & Neuromuscular (include respiratory function) expertise in the spec *as necessary* for paediatric MDT	Section 7.4 - Essential Staff Groups	Following discussion with the 3 newly commissioned services – reflecting patient need	Sarah Watson	August 2023
Spec previously had a long list of outcomes and metrics	Metrics removed and outcome measures rationalised and updated	Quality Outcomes and indicators table	In line with requirements of the Specialised Commissioning Quality Assurance & Improvement Framework	Sarah Watson	August 2023
Number of centres to be commissioned as adults and paediatric centres	Commissioned centres listed following outcome of service procurement	7.8 Commissioned providers	Centres listed following contract award	Sarah Watson	August 2023