European Reference Networks

ERNs – OVERVIEW OF ALL 24 ERNs

Co-funded by the EU

Overview and key facts – ERN BOND

ERN BOND members

- As of 2024, **50** HCPs in **19** countries are members of ERN BOND:
  - ✓ **14** Member States with **44** Full Members
  - ✓ **1** Member States with **2** Associated National Centres
  - ✓ **4** Member States with a Coordination Hub
- Collaboration with **9** patient representatives

ERN BOND disease areas

- **Skeletal dysplasias** and **metabolic bone-related conditions** and all rare diseases **affecting cartilage, bone, and dentine**
- **771** different rare bone disorders associated with **552** genes, classified into **41** groups (Nosology of genetic skeletal disorders: 2023 revision, Unger et al., 2023)

Guidelines and care pathways

- **1** guideline written by ERN BOND under drafting
- **26** endorsed by ERN BOND and authored by ERN BOND members
- Patient journeys in progress

Education

- **22** webinars organised by the ERN since 2021 and **6** in collaboration with ERICA project
- **6** short exchange programs
- **13** thematic workshops

CPMS

- **54** CPMS case discussions since October 2017

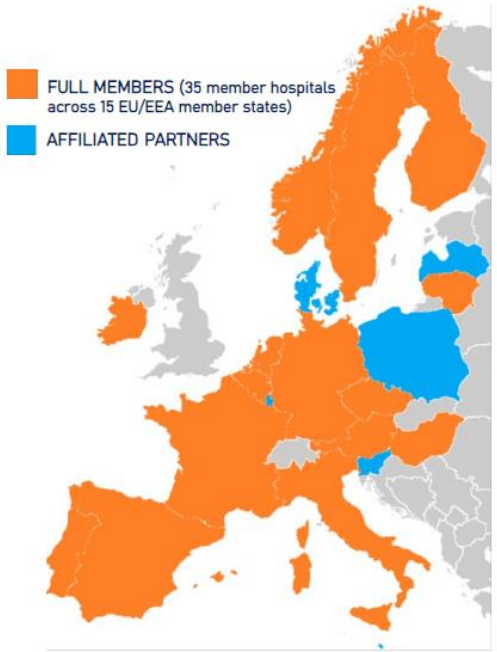
Research & Registry

- **32** number of relevant research projects or clinical trials involving at least two HCPs from two different member states (2023 monitoring exercise)
- **4223** number of patients in the registry (Bone diysplasia - Calcium & Phosphate)
- EuRR-Bone website: https://eurreb.eu/

OVERVIEW AND KEY FACTS – ERN CRANIO

ERN CRANIO members

- As of November 2023, 42 HCPs in 22 countries are members of ERN CRANIO:
  - ✓ 15 Member States with 35 Full Members
  - ✓ Member States with 5 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 10 patient representatives
- 8 Supporting partners (among which 2 Ukrainian hospitals)



ERN CRANIO disease areas

- Craniofacial anomalies
- Cleft lip/palate and odontologic disorders
- ENT disorders

Launched 10 cross-disease area working groups

Guidelines and care pathways

- 5 guidelines written by ERN CRANIO
- 1 consensus statement written by ERN CRANIO
- 6 guidelines co-authored and endorsed by ERN CRANIO
- 2 patient-friendly guidelines
- 3 patient journeys

Education

- 12 webinars organised by the ERN since 2017
- Over 60 exchanges since 2017
- 1 UEMS accredited course: Monobloc course

CPMS

- 43 number of CPMS case discussions since 2017

Research & Registry

- 45 number of relevant research projects or clinical trials involving at least two HCPs from two different member states
- 10 number of patients in the registry. [ERN CRANIO (molgenis.net)]

European Reference Network
for rare or low prevalence complex diseases
Network Craniofacial anomalies and ear, nose and throat disorders (ERN CRANIO)

Overview and key facts – Endo-ERN

Endo-ERN members

- As of November 2023, 105 HCPs in 28 countries are member of Endo-ERN:
  - ✓ 21 Member States with 91 Full Members
  - ✓ 6 Member States with 13 Associated National Centres
  - ✓ 1 Member State with a Coordination Hub
- Collaboration with 19 patient representatives in 9 countries

Endo-ERN main thematic groups

- Adrenal
- Disorders of Calcium & Phosphate Homeostasis
- Genetic Disorders of Glucose & Insulin Homeostasis
- Genetic Endocrine Tumour Syndromes
- Growth & Genetic Obesity Syndromes
- Hypothalamic and Pituitary Conditions
- Sex Development & Maturation
- Thyroid

Endo-ERN covers both paediatric and adult expertise

Guidelines and care pathways

- 4 Clinical Practice guidelines written by Endo-ERN
- ~60 guidelines co-authored and/or endorsed by Endo-ERN
- 1 care pathway
- 3 patient journeys

Education

- 60+ Endo-ERN specific webinars organised since 2019
- Joint webinar program with European Endocrine societies (adult & paed)
- Endo-ERN symposium at Annual Conferences European Endocrine Societies
- Endo-ERN Clinical exchange program
- Endorsement / accreditation of educational activities

Clinical Patient Management System

- 236 CPMS virtual case discussions since 2017

Research & Registry

- ~196 relevant research projects or clinical trials involving at least two HCPs from two different Member States
- ~3350 patients in the Core Registry https://eurreb.eu (shared platform with ERN BOND)

Overview and key facts - EpiCARE

ERN EpiCARE members

❖ As of September 2024, **61** HCPs in **24** countries are members of ERN EpiCARE:

- ✓ **38** Full Members (including 6 Consortia)
- ✓ **10** affiliated members (1 Consortium)
- ✓ **2** Member States with a Coordination Hub

Several supporting medical teams in the European region also closely collaborate with EpiCARE.

❖ Collaboration with **22** patient representatives (patient associations)

ERN EpiCARE disease areas

- 160 rare forms of epilepsy, a number steadily augmenting as new forms of genetic epilepsies are identified.
- Highly complex cases of focal epilepsies that could benefit from a pre-surgical evaluation and surgical treatment.
- Early screening of new-onset epilepsies to identify those suffering from rare or complex forms.

Guidelines and care pathways

- ❖ **9** guidelines written by ERN EpiCARE
- ❖ **12** guidelines co-authored and endorsed by ERN EpiCARE
- ❖ **20** patient leaflets (**11** published), translated into several EU languages
- ❖ **20** patient journeys (**9** published), translated into several EU languages

Education

❖ **85** webinars performed (4 more planned for 2024) / 2 COVID-19 specific webinars in response to the pandemic (2020) and one on the Ukraine war.

❖ Our **exchange program** supported nurses working in epilepsy units and neuropsychologists

❖ Other relevant training activities: Mentor-mentee program in progress;

30 participations (in 4 years) of young clinicians to the Rome workshop;

10 support of young clinicians to present their work at scientific congresses.

CPMS (since 2017)

- ❖ **230** cases have been created on CPMS for EpiCARE
- ❖ **240** registered users in the CPMS platform
- ❖ In 2024 there were **85** active users
- ❖ 2 face-to-face discussions per year (U-task)

Research & Registry

❖ **85** research projects or clinical trials involving at least two HCPs from two different member states.

❖ At least **70% of all centres** (35 of 50 member centres) are using/going to use the EpiCARE registry REDCap template.

❖ **9500** patients are already in local REDCap EpiCARE registries.

❖ <u>Research Initiatives</u>:

- Genetic Collaborative Research Platform
- Grant Opportunities platform
- Tools for developing research projects: Harmonized Data Transfer Agreement Template, CTIS Submission Guidelines

EpiCARE

European Reference Network
for rare or low prevalence complex diseases

Overview and key facts - ERKNet

ERKNet members

- As of November 2023, 72 HCPs (110 units) in 25 countries are members of ERN ERKNet:
  - ✓ 18 Member States with 63 Full Members
  - ✓ 6 Member States with 8 Associated National Centres
  - ✓ 1 Member State with a Coordination Hub
- Collaboration with 34 patient representatives

ERKNet disease areas

- Glomerulopathies
- Congenital malformations & Ciliopathies
- Tubulopathies
- Metabolic & Stone Disorders
- Thrombotic Microangiopathies
- Pediatric CKD & Dialysis
- Pediatric Transplantation
- Rare Causes of Hypertension

Guidelines and care pathways

- 14 guidelines written by ERKNet
- 62 endorsed guidelines by ERKNet
- 3 care pathway in progress
- 12 patient journeys developed

Education

- 121 webinars organised by the ERN since 02/2018
- 6 CME courses organised by ERKNet
- 10 ERKNet research mobility exchanges (EJP-RD)
- 63 clinical exchanges (30 HCPs, 17 countries) since 2021
- Structured 3-year postgraduate curriculum for rare kidney diseases (347 students)

CPMS

- 39 CPMS case discussions since 05/2018

Research & Registry

- Significant high participation in relevant research projects or clinical trials involving at least two HCPs from two different member states
- >26.000 patients in the ERKReg registry www.erknet.registry,.org

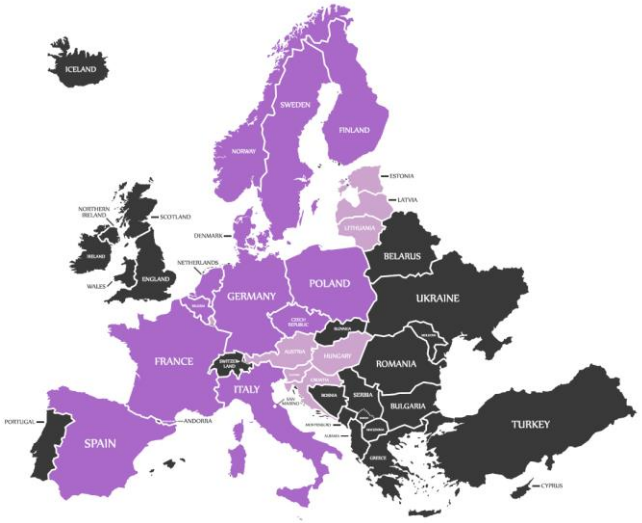
European Reference Network
for rare or low prevalence complex diseases

ERKNet
The European Rare Kidney Disease Reference Network

OVERVIEW AND KEY FACTS - ERNICA

ERNICA members

- As of November 2023, 52 HCPs in 21 countries are members of ERNICA:
  - ✓ 12 Member States with 39 Full Members
  - ✓ 5 Member States with 9 Associated National Centres
  - ✓ 4 Member States with a Coordination Hub
- Collaboration with 13 patient organisations and 4 individual parents of patients



ERNICA's six disease areas

- Esophageal diseases
- Intestinal diseases
- Gastroenterological diseases
- Intestinal failure
- Abdominal wall defects
- Malformations of the diagphragm

Guidelines and care pathways

- 6 guidelines written by ERNICA
- 0 guidelines co-authored and 0 endorsed by ERNICA
- 2 patient journeys

Education

- 44 webinars organised by the ERN in 2020-2023
- Other relevant training activities: colorectal and CDH training courses, course on prenatal assessment, flagship training programme, clinical exchange programmes (15 visitors in 2023), educational videos and animations on YouTube

CPMS

- 5 CPMS case discussions were followed by an outcome report in 2020-2023

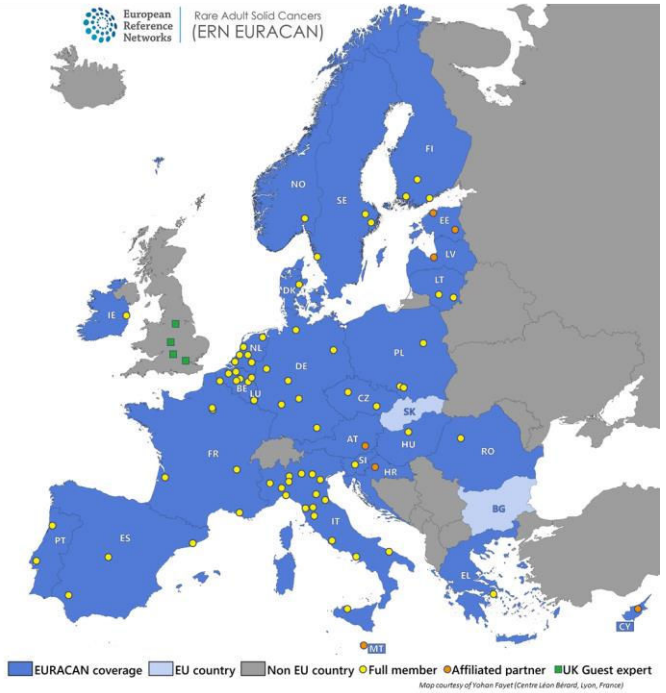
Research & Registry

- 24 relevant research projects or clinical trials involving at least two HCPs from two different member states in 2023 (more related project listed in the ERNICA Research Catalogue: https://www.ern-ernica.eu/ernica-research-catalogue)
- 30 centers connected to the EPSA|ERNICA registry in 2023, including 3076 patients. Link to registry: https://www.ern-ernica.eu/registry

OVERVIEW AND KEY FACTS - EURACAN

ERN 106 members

- As of November 2023, **106** HCPs in **26** countries are members of ERN EURACAN:
  - ✓ **19** Member States with **97** Full Members
  - ✓ **5** Member States with **7** Associated National Centres
  - ✓ **2** Member States with a Coordination Hub
- Collaboration with **14** patient representatives



ERN 10 disease areas

- Connective tissue (sarcomas)
- Female genital organs and placenta
- Male genital organs and urinary tract
- Neuroendocrine system
- Digestive tract
- Endocrine organs
- Head and neck
- Thorax
- Skin and eye melanoma
- Brain and spinal cord

Guidelines and care pathways

- **18** guidelines co-authored with scientific societies and **6** endorsed by ERN EURACAN

Education

- **22** online courses organised by the ERN EURACAN + **42** lectures organised in collaboration with ESO since 2017
- short exchange program: **40** participants from around **30** HCPs since 2021
- Other relevant training activity: professorship programme since 2023

CPMS

- 106 cases uploaded and discussed on the CPMS since January 2022

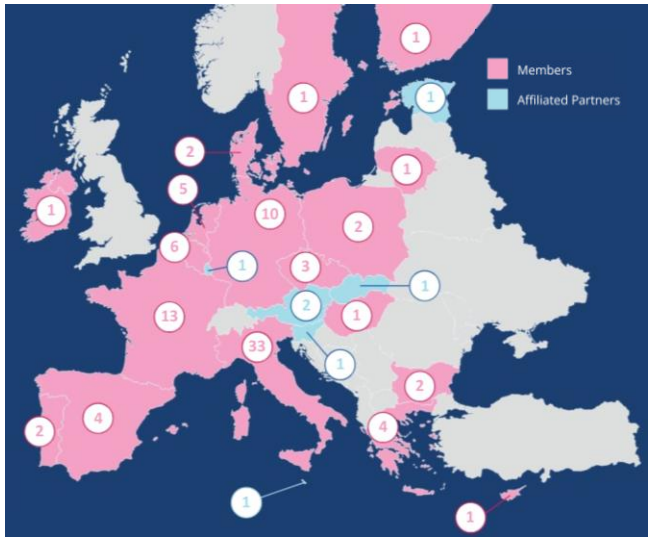
Research & Registry

- **844** relevant research projects or clinical trials involving at least two HCPs from two different member states
- **6600** patients included in the registry.

Overview and key facts - EuroBloodNet

ERN-EuroBloodNet members

- As of November 2023, 97 HCPs in 24 countries are members of ERN-EuroBloodNet:
  - ✓ 18 Member States with 90 Full Members
  - ✓ 3 Member States with 4 Associated National Centres
  - ✓ 3 Member States with a Coordination Hub
- Collaboration with 11 ePAGs and 52 National Patients Organizations involved in ERN actions



ERN-EuroBloodNet 6 disease areas

4 non-oncological disease areas (pediatrics and adults):

- Rare Red blood cell defects
- Bone marrow failure and hematopoietic disorders
- Rare bleeding-coagulation disorders and related diseases
- Hemochromatosis and other rare genetic disorders of iron metabolism and heme synthesis

2 oncological disease areas (adults):

- Lymphoid malignancies
- Myeloid malignancies

European Reference Network
for rare or low prevalence complex diseases
Network Hematological Diseases (ERN EuroBloodNet)

Guidelines and care pathways

- 4 guidelines written by ERN-EuroBloodNet. 4 under development.
- 70 guidelines endorsed by ERN-EuroBloodNet. Repository searchable in website.
- 7 EU mappings on availability of Highly Specialized Procedures (diagnosis/prevention/treatment) standards of care not available in all EU-MS.
- 0 care pathways.
- 1 patient journey under development.
- 55 patient requests for cross-border health assistance. 19 of them, requests of assistance from Ukrainian citizens.

Education

- 330 educational trainings (including webinars, videos and patients onsite trainings) organised by the ERN since 2019
- 13 short exchange program since 2019
- 8 training courses endorsed by the ERN since 2022
- 1 publication on ERN-EuroBloodNet Educational Strategy

CPMS

- 57 CPMS case discussions since 2017

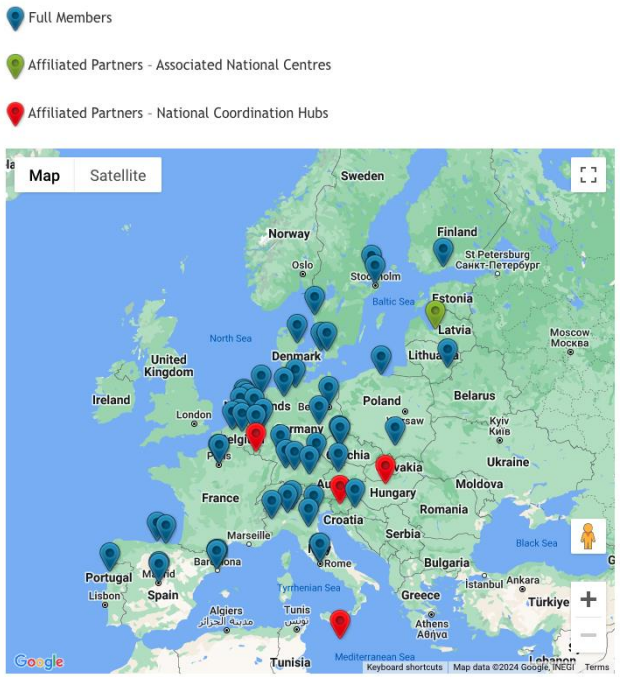
Research & Registry

- 95 clinical trials involving at least two HCPs from two different member states in 2023, 1 of them acknowledging ERN.
- 1 clinical trial sponsored by the ERN.
- 18 observational studies involving at least two HCPs from two different member states in 2023, 11 of them acknowledging ERN.
- ERICA WP3 Leaders, ERDERA WP10 Leaders
- 770 patients with legal basis to be transferred to ENROL registry, wating for data transfer agreement signature. www.enrolnetwork.eu

OVERVIEW AND KEY FACTS - EUROGEN

ERN eUROGEN members

- As of November 2023, 56 HCPs in 20 countries are members of ERN eUROGEN :
  - ✓ 15 Member States with 51 Full Members
  - ✓ 1 Member State with 1 Associated National Centres
  - ✓ 4 Member States with 4 Coordination Hubs
- Collaboration with 9 patient representatives



ERN eUROGEN disease areas

- Workstream 1: rare congenital uro-recto-genital anomalies (paediatrics)
- Workstream 2: functional urogenital conditions requiring highly specialised surgery (adults)
- Workstream 3: rare urogenital tumours

Guidelines and care pathways

- 3 new Clinical Practice Guidelines written by ERN eUROGEN, 2 more under development
- 11 Clinical Decision Support Tools under development
- 1 Care Pathway under development
- 5 Patient Journeys

Education

- 113 webinars organised by the ERN since June 2019
- Short exchange programme (1 February to 31 August 2023, now on hold)
- 4 other training activities (3 surgical colorectal courses + 1 flagship surgical training programme in development with ERN ERNICA)

CPMS

- 205 CPMS case discussions since June 2017

Research & Registry

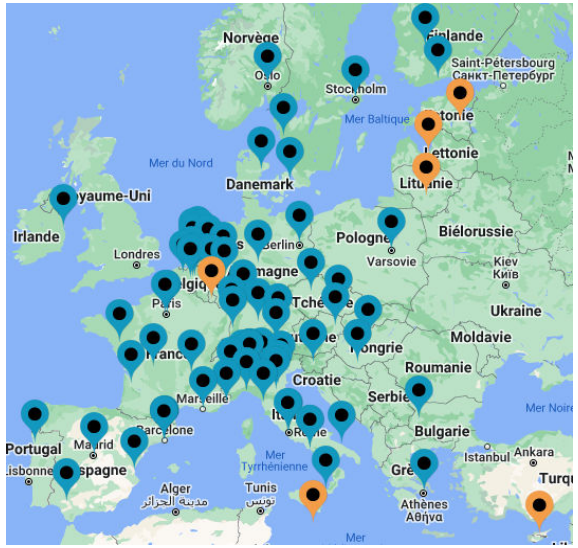
- 7 research projects or clinical trials involving at least two HCPs from two different member states (1x research project + 6x clinical snapshots)
- 1011 number of patients in the registry. [Registry - ERN eUROGEN (eurogen-ern.eu)]

European Reference Network
for rare or low prevalence complex diseases
Network Urogenital Diseases (ERN eUROGEN)

OVERVIEW AND KEY FACTS – EURO-NMD

ERN 82 members

- As of November 2023, 82 HCPs in 25 countries are members of ERN EURO-NMD:
  - ✓ 18 Member States with 74 Full Members
  - ✓ 5 Member States with 6 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 27 patient representatives



ERN 5 disease areas

- Muscle Diseases, orpha 98472
- Neuromuscular Junction disorders, orpha 98491
- Motoneuron disorders, orpha 98503
- Peripheral Nerve disorders, orpha 98496
- Mitochondrial disorders, orpha 68380

Guidelines and patient journeys

- 6 guidelines written by ERN EURO-NMD
- 26 guidelines co-authored and 26 endorsed by ERN EURO-NMD
- 3 patient journeys (3 more to come)

Education

- 75 webinars organised by the ERN since 2019
- 23 short exchange programs
- 8 summer schools on translational research/multidisciplinary care

CPMS

- 140 CPMS case discussions since 170

Research & Registry

- 185 number of relevant research projects or clinical trials involving at least two HCPs from two different member states
- 1 number of patients in the registry. (5 HCP onboarded)

European Reference Network
for rare or low prevalence complex diseases
Network Neuromuscular Diseases (ERN EURO-NMD)

Overview and key facts – ERN-EYE

ERN-EYE members

- As of November 2023, 59 HCPs in 24 countries are members of ERN-EYE:
  - ✓ 18 Member States with 51 Full Members
  - ✓ 6 Member States with 8 Associated National Centres
  - ✓ 24 Member States with a Coordination Hub
- Collaboration with 9 patient representatives

ERN-EYE disease areas

- Retinal Diseases
- Neuro ophthalmology
- Pediatrics Rare Eye Diseases
- Anterior Segment

Guidelines and care pathways

1 consensus statement published written by ERNKnet, Endo-ERN, ERN-Ithaca, ERN-EYE

- 6 consensus statement in the finalization phase by ERN-EYE
- 0 care pathways
- 0 patient journeys

Education

- 10 webinars organised by ERN-EYE since 2021
- short exchange program
- elearning programme on Inherited Retinal Diseases
- Educational videos
- Serious game

CPMS

- 163 CPMS case discussions since 2017

Research & Registry

- 31 relevant research projects and clinical trials involving at least two HCPs from two different member states
- 6 number of patients in the registry. https://redgistry.eu/

European Reference Network
for rare or low prevalence complex diseases
Network Eye Diseases (ERN-EYE)

Overview and key facts – ERN GENTURIS

Aims of ERN GENTURIS

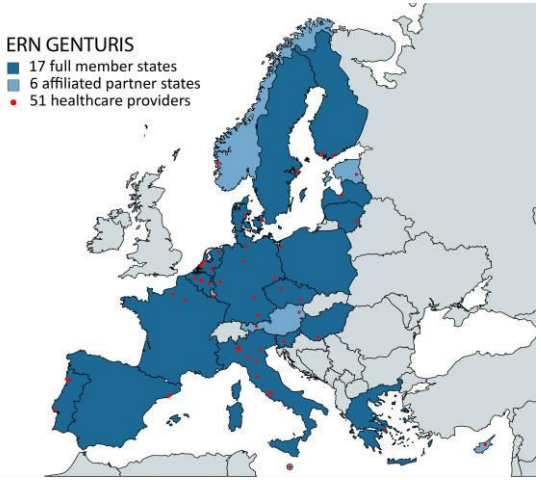
- Improved identification of people living with a genetic tumour risk syndromes (genturis)
- Reduced variation in clinical practice and outcomes
- Development of evidence based clinical guidelines
- Development and use of patient registries, and research projects
- Defined health care pathways to facilitate improved access to international specialist clinical knowledge throughout the EU
- Giving a home to all people with a genturis

ERN GENTURIS disease areas

- Schwannomatosis & neurofibromatosis
- Lynch syndrome and polyposis
- Hereditary Breast and Ovarian Cancer Syndrome
- Other rare – predominantly malignant – genturis

ERN GENTURIS members

- As of November 2023, 51 HCPs in 23 countries are members of ERN GENTURIS:
  - ✓ 17 Member States with 44 Full Members
  - ✓ 4 Member States with 5 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub



Guidelines and pathways

- 6 guidelines written by ERN GENTURIS
- 3 guidelines co-authored and 15 endorsed by ERN GENTURIS
- Care pathways for all ERN GENTURIS disease areas
- Patient journeys for all ERN GENTURIS disease areas

Education

- ERN GENTURIS e-Training Programme: ~60 free webinars on demand.
- **Every even year** a course for geneticists on Hereditary Cancer Genetics in Bertinoro, Italy (in collaboration with ESHG)
- **Every odd year** a course for medical oncologists on Hereditary Cancer Genetics in Paris, France (in collaboration with ESMO)

CPMS

- Recurring CPMS meetings on every first and third Friday of the month with 10-20 experts attending.

Research & Registries

- 12 Research projects in which at least two ERN GENTURIS HCPs from different countries are participating,
- 1200+ patients in the Registry: https://genturis-registry.eu/

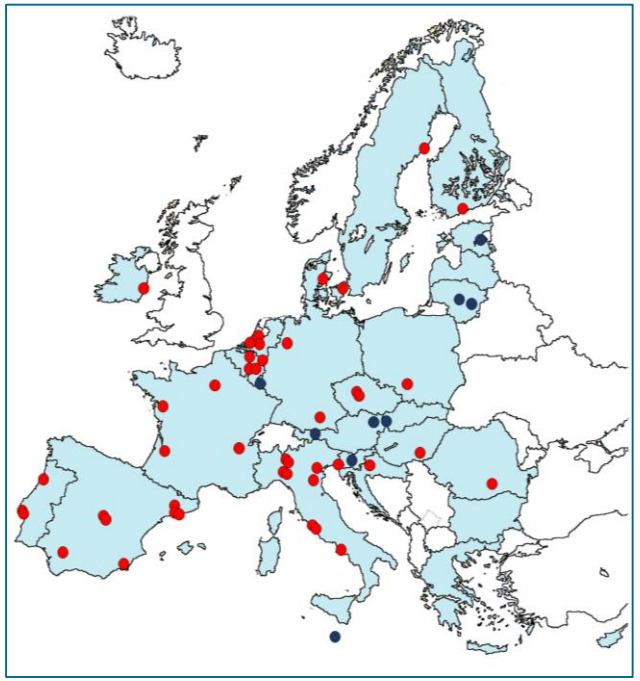
European Reference Network for rare or low prevalence complex diseases
Network Genetic Tumour Risk Syndromes (ERN GENTURIS)

ERN GENTURIS
With every diagnosis we can help an entire family

Overview and key facts – GUARD-Heart

ERN GUARD-Heart members

- As of January 2022, 53 HCPs in 23 countries are members of ERN GUARD-Heart:
  - ✓ 16 Member States with 44 Full Members
  - ✓ 5 Member States with 7 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 23 patient representatives (15 e-PAGs and 8 supporting partners)



ERN GUARD-Heart disease areas

- Familial electrical diseases
- Familial cardiomyopathies
- Special electrophysiology conditions in children
- Congenital heart diseases
- Other rare heart diseases

Guidelines and care pathways

- 24 guidelines (co)-authored and endorsed by ERN GUARD-Heart
- 0 care pathways
- 1 patient journey

Education

- 20 webinars organised by the ERN since July 2022
- ongoing exchange program (15 packages per ERN-year)
- 22 layperson abstracts of ERN-publications available on website
- summerschool programme (one per year)

CPMS

- 173 number of CPMS case discussions since 2018

Research & Registry

- 93 number of relevant peer reviewed publications involving at least two HCPs from two different member states
- 12 disease specific registries (and another 11 in preparation; website: https://guardheart.ern-net.eu)

European Reference Network
for rare or low prevalence complex diseases
Network Heart Diseases (ERN GUARD-HEART)

OVERVIEW AND KEY FACTS - ITHACA

Aims of ERN ITHACA

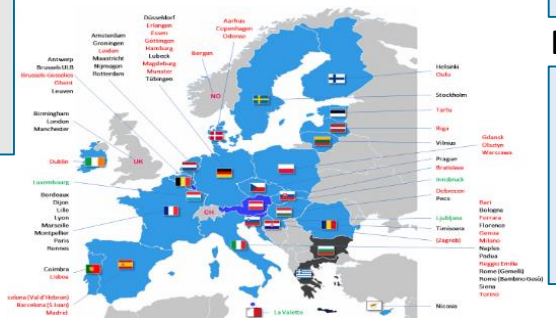
- Improving the diagnosis of patients with rare developmental or neurodevelopmental disorders
- Improving and disseminating knowledge the field
- Improving patients' quality of life and appropriate daily care

ERN ITHACA disease areas

- Developmental (**malformations** & **dysmorphisms**) and neurodevelopmental (**intellectual disability** & **autism**) disorders from genetic, genomic or environnmental origin
- Includes prenatal diagnosis and foetal pathology of RD
- NDDs affect more than 3% of the EU population, half of whom have a RD of genetic origin and fall within the scope of ITHACA.
- ITHACA covers more than 5000 different Rare Diseases, including more than 2500 monogenic causes of intellectual disability or autism.
- Spina bifida and related abnormalities are a specific area of activity with inter-ERN connectivity

ERN ITHACA members

- 71 HCPs in 25 EU countries & Norway, including 3 Hubs
- Most Members are clinical Genetics Departments in Academic Hospitals
- Connexions with affiliated partner networks in Switzerland an Turkey (other coming)
- Patient Advisory Board counts more than 60 PAGs and ePAGs



Clinical Pracice Guidelines & Consensus statements

- 5 CPG written by ERN ITHACA (and several in their final stage)
  - Disorder specific guidelines
  - Transversal guidelines
- 1 guideline co-authored and several endorsed

Workshops

- EuroNDD : bi-annual multidisciplinary 2-day workshop on NDD, rotating
- EuroDysmorpho : 4-day workshop, annual, rotating
- Fetal pathology Winter school : annual, in Paris

Dissemination & education

- ITHACA e-Training Programme: 14 free webinars on demand. New Webinars now on a monthly basis
- APOGeE free online Handbook on medical genetics
- MOOC BIG (bioinformatics in genetics)
- MOOC" Diagnosing RD: from the Clinic to Research and back" (with EJPRD)
- Support to Manchester Dysmorphology meeting (bi-annual)
- Writing/editing > 80 clinical summaries for ORPHANET
- Contribution to Orphanet classification update and enrichment of HPO thesaurus
- "Genetics survival guide" (collaboration with Dundee University)

Research & Registries

- Over 160 call for collaborative call for collaboration in clinical research
- ILIAD RD registry
  - Focus on rare monogenic neurodevelopmental disorders
  - Public access by end 2024

ITHACA
European Reference Network for rare or low prevalence complex diseases
Network Intellectual Disability and Congenital Malformations (ERN ITHACA)

OVERVIEW AND KEY FACTS - METABERN

European Reference Network | MetabERN
European Reference Network for Hereditary Metabolic Disorders

METABERN AIMS

- Improve information exchange between network members;
- Improve diagnosis and care in disease areas where expertise is rare;
- Support all Member States to provide highly specialised care to patients with Inherited Metabolic Disorders (IMDs);
- Advance innovation in medical science and health technologies for IMDs;
- Provide cross-border medical training and research on IMDs;
- Support all patient initiatives towards harmonising and improving all aspects of the care chain.

METABERN DISEASE SPECIFIC SUBNETWORKS

- AOA - Amino and Organic acids-related disorders
- C-FAO - Carbohydrate, fatty acid oxidation and ketone bodies disorders
- CDG - Congenital Disorders of Glycosylation and disorders of intracellular trafficking
- LSD - Lysosomal Storage disorders
- NOMS - Disorders of neuromodulators and other small molecule
- PD - Peroxisomal disorders
- PM-MD -Pyruvate metabolism mitochondrial oxidative phosphorylation disorders, Krebs cycle defects, disorders of thiamine transport & metabolism

METABERN NETWORK

- 94 Health Care Providers from 26 EU Countries + UK
- Involving over 3000 medical professionals
- Treating over 80.000 patients
- With more than 1400 IMDs divided into 7 disease-specific Subnetworks
- Involving over 40 patient organisations

RESEARCH

- Over 227 scientific publications
- Use of the U-IMD registry: 29 participating centers, 3341 registered patients, 3290 active patients
- Facilitation and harmonization of NBS in EU: addition of a new module on the U-IMD Registry

EDUCATION

- Participation and provision of input and insights from patients and HCPs in Education of patients
- Improvement of knowledge and training of healthcare professionals in the field of IMDs: more than 500 training activities hosted by member centres
- Implementation and promotion of the MetabERN Diagnostic Clinical and Therapeutic Education Programme: over 500 enrolled learners

DIAGNOSIS & TREATMENT

- Almost 250 active users and 125 panels on the CPMS
- Review/development of Care Pathways and Patient Journeys
- Over 16 new Guidelines developed
- Participation in the production of White papers and Recommendations
- Creation of big databases with patients' data
- Improvement of Regulatory process for medicines

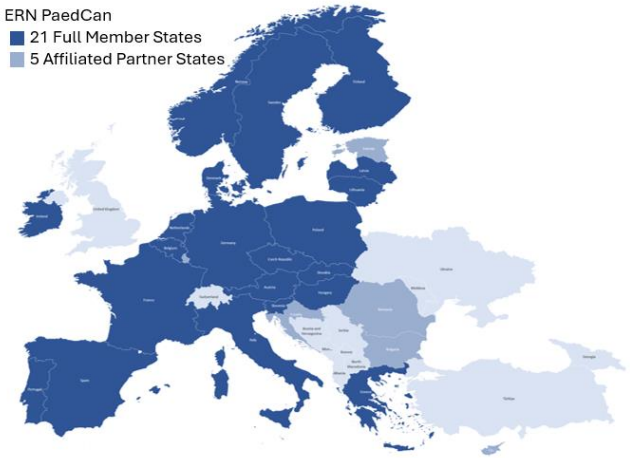
PATIENT EMPOWERMENT

- Establishment of a Patient Executive Committee (PEC), the voice of all patient representatives involved in the subnetworks and Work Packages, with the aim to improve their involvement and enable their feedback to be heard by HCPs
- Involvement of patients in addressing their specific needs, preferences and priorities (Survey, feedback systems, etc.)

Overview and key facts - PaedCan

ERN PaedCan members

- As of November 2023, 90 HCPs in 28 countries are members of ERN PaedCan:
  - ✓ 21 Member States with 79 Full Members
  - ✓ 5 Member States with 9 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 1 European umbrella organization of patients and parents´ representatives, that has 66 members in 33 countries.



ERN PaedCan disease areas

- Leukaemia
- Brain Tumours
- Lymphomas
- Neuroblastoma
- Renal Tumours
- Soft Tissue Sarcomas
- Bone Sarcomas
- Liver Tumours
- Germ Cell Tumours
- Retinoblastoma
- Very Rare Tumours (paediatric and AYA population)

Guidelines and care pathways

- 25 European European Standard Clinical Practice guidelines written by ERN PaedCan.

Education

- 42 webinars organised by ERN PaedCan since 2021
- ERN PaedCan Training/Twinning programs
- SIOP Europe Course in Paediatric Oncology
- SIOP Europe Virtual Courses
- SIOP Europe Student Summer School
- ESO-SIOPE Masterclass, e-Learning, fellowships and multidisciplinary course

CPMS

- 287 CPMS case discussions since 2018

Research & Registry

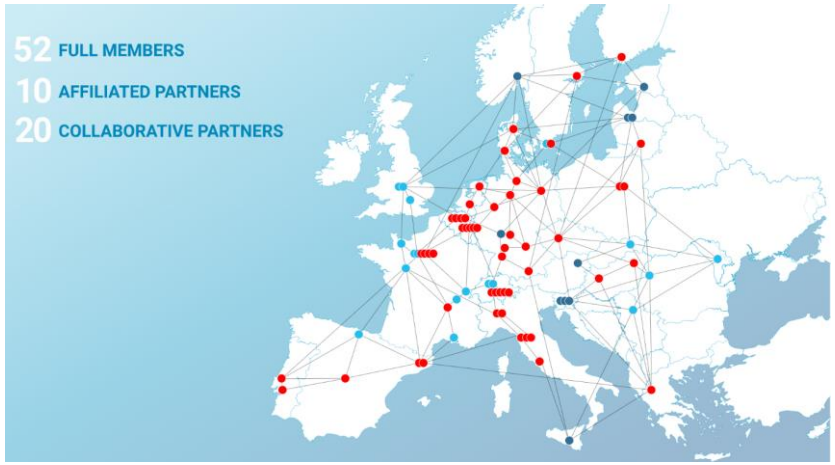
- 29 patients registered in the PARTNER registry for Very Rare Tumours. https://partner.datariverweb.com/myhealthtest/
- ESCP Registry on the delivery of standard clinical practice treatments across Europe (under ethical approval in respective Member States)

European Reference Network
for rare or low prevalence complex diseases
Network Paediatric Cancer (ERN PaedCan)

OVERVIEW AND KEY FACTS – RARE-LIVER

ERN RARE-LIVER members

- As of November 2023, 82 HCPs in 29 countries are members of ERN RARE-LIVER:
  - ✓ 15 Member States with 52 Full Members
  - ✓ 8 Member States with 10 Associated National Centres
  - ✓ 11 Member States with 20 Coordination Hubs
- Collaboration with 15 patient representatives



Guidelines and care pathways

- 8 guidelines co-authored and 7 endorsed by ERN RARE-LIVER since 2017
- 3 care pathways (in progress)

Education

- 35 webinars organised since 2020
- Annual ERN RARE-LIVER Academies (2 day onsite program)
- Variety of videos targeting actual topics in rare liver diseases

CPMS

- 45 CPMS case discussions since 2024

ERN RARE-LIVER disease areas

- Pillar 1: Autoimmune Liver Diseases
- Pillar 2: Metabolic, Biliary Atresia & Related Disease
- Pillar 3: Structural Liver Disease

Research & Registry

- 6 relevant research projects and more than 50 clinical trials involving at least two HCPs from two different member states currently ongoing
- 2787 patients in the registry. R-LIVER Registry (rare-liver.eu)

European Reference Network
for rare or low prevalence complex diseases

ERN RARE-LIVER

OVERVIEW AND KEY FACTS – ERN RECONNET

ERN ReCONNET - 53 members

- As of November 2023, 64 HCPs in 23 countries are members of ERN ReCONNET:
  - 15 Member States with 53 Full Members
  - 5 Member States with 6 Associated National Centres
  - 3 Member States with a Coordination Hub
- Collaboration with 16 patient representatives

ERN ReCONNET disease areas

- Antiphospholipid Syndrome
- Ehlers-Danlos Syndromes
- Idiopathic Inflammatory Myopathies
- IgG4-Related Diseases
- Mixed Connective Tissue Diseases
- Relapsing Polychondritis
- Sjögren's Syndrome
- Systemic Lupus Erythematosus
- Systemic Sclerosis
- Undifferentiated Connective Tissue Diseases

European Reference Network
for rare or low prevalence complex diseases

Network Connective Tissue and Musculoskeletal Diseases (ERN ReCONNET)

Guidelines and care pathways

- Supplement of the State of the Art of existing guidelines and unmet needs (12 scientific publications)
- RarERN Path® - Methodology for the design of organisational care pathway models and application in all 10 diseases
- Red Flags on early diagnosis and referral
- Points to Consider for treating patients living with autoimmune rheumatic diseases with antiviral therapies and anti-SARS-CoV-2 antibody products
- Quality measures in Transition of care in rCTDs
- Lay versions and resources for patients on guidelines

Education

- 72 webinars organised by the ERN since 2019
- 43 short exchange programme visitis organized so far
- Accredited online course to be launched in 2025
- Accredited course on transition of care

CPMS

- Over 50 CPMS case discussions since 2018

Research & Registry

- 7 clinical trials involving at least two HCPs from two different Member States
- Supplement "Rare inside Rare" with 18 scientific publication
- TogetherERN ReCONNET Registry Platform being finalised
- ERN ReCONNET 2nd Scientific congress, Prague, April 2025
- Mapping of coding systems and cross-border procedures in ERN HCPs
- VACCINATE – ERN ReCONNET multicentre prospective cohort study on vaccination
- Dedicated WG on Research and Quality of Care and WG on Registries and eHealth

Overview and key facts – ERN RITA

ERN RITA members

- As of November 2023, 71HCPs in 26 countries are members of ERN RITA:
  - ✓ 19 Member States with 62 Full Members
  - ✓ 4 Member States with 7 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 12 patient representatives

ERN RITA disease areas

- Primary immunodeficiencies
- Autoinflammatory disorders
- Autoimmune diseases
- Paediatric rheumatic diseases

Guidelines and care pathways

- 8 guidelines co-authored and 3 endorsed by ERN RITA
- ERN RITA Patient Journey Handbook
- 3 Patient Journeys

Education

- 40 webinars organised by the ERN since 2020
- Tuesday Lunch webinar series
- Patient-centred webinars
- short exchange programmes among ERN RITA HCPs

CPMS

- 149 of CPMS case discussions

Research & Registry

- 126 relevant research projects or clinical trials involving at least two HCPs from two different member states
- Development of a network registry that includes new patients treated by ERN RITA HCPs

European Reference Network for rare or low prevalence complex diseases

rita Primary Immunodeficiencies / Autoinflammatory Disorders Autoimmune Diseases / Paediatric Rheumatic Diseases

Overview and key facts – ERN-RND

ERN-RND members

- As of November 2023, 68 HCPs in 24 countries are members of ERN-RND:
  - ✓ 20 Member States with 64 Full Members
  - ✓ 2 Member States with 2 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 9 patient representatives

ERN-RND disease areas

- Ataxia and HSP
- HD and Choreas
- Dystonia, paroxysmal disorders and NBIA
- Leukoencephalopathies
- Atypical parkinsonian syndromes
- Frontotemporal dementia

Guidelines and care pathways

- 4 guidelines under development by ERN-RND
- 7 guidelines endorsed by ERN-RND
- 21 care pathways
- 5 patient journeys

Education

- As of August 2024, 100 webinars organised by the ERN-RND
- Short exchange program: until end of 2023, 16 healthcare professionnals visited 12 host institutions
- 5 winter schools
- Together with EAN and EPNS, ERN-RND develops a postgraduate curriculum for RND

CPMS

- 323 CPMS case discussions since 2017

Research & Registry

- ERN-RND members participate in 12 observational studies and 16 clinical trials involving at least two HCPs from two different member states
- ERN-RND members have a leading role in flagship European RD Research projects and initiatives such as Solve-RD and ERDERA
- > 12 000 patients in the registry in 2024.

European Reference Network
for rare or low prevalence complex diseases
Network Neurological Diseases (ERN-RND)

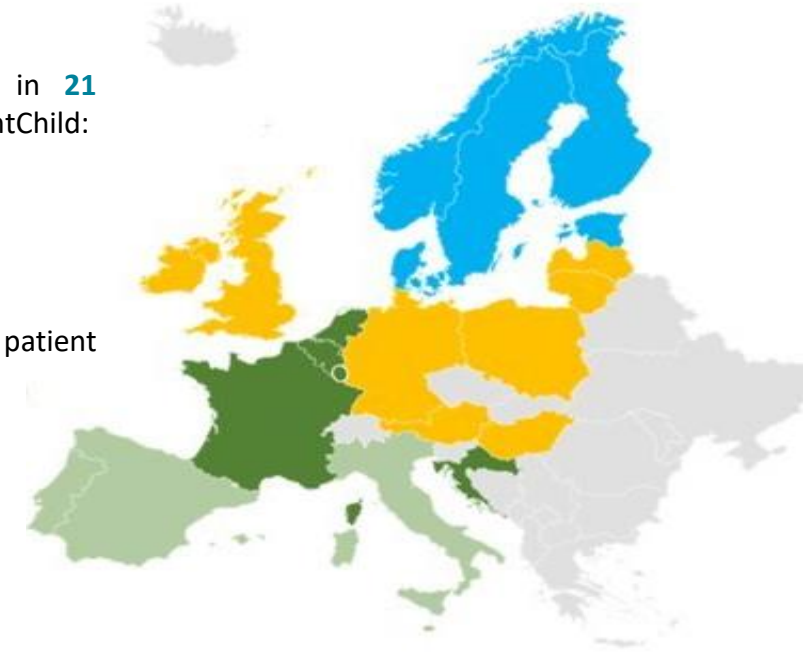
Overview and key facts - TransplantChild

ERN TransplantChild members

❖As of September 2024, **40** HCPs in **21** countries are members of ERN TransplantChild:

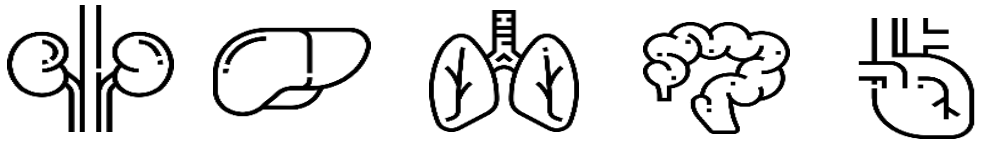
- ✓ 33 Full Members
- ✓ 7 affiliated Partners
- ✓ 3 supporting Partners

❖ Collaboration with 13 patient representatives



ERN Paediatric Transplantation areas:

❖ Solid Organ Transplantation



❖ Haematopoietic Stem Cell Transplantation

Guidelines and care

❖ 2 guidelines written by ERN TransplantChild
❖ 2 published and 2 ongoing Clinical Audits

Education

❖ 130 webinars organised by the ERN since 2018
❖ 17 short exchange programmes since 2018
❖ 5 TransplantChild Workshops

CPMS

❖ 278 CPMS case discussions since 2017

Publications

❖ 10 documents published since 2020

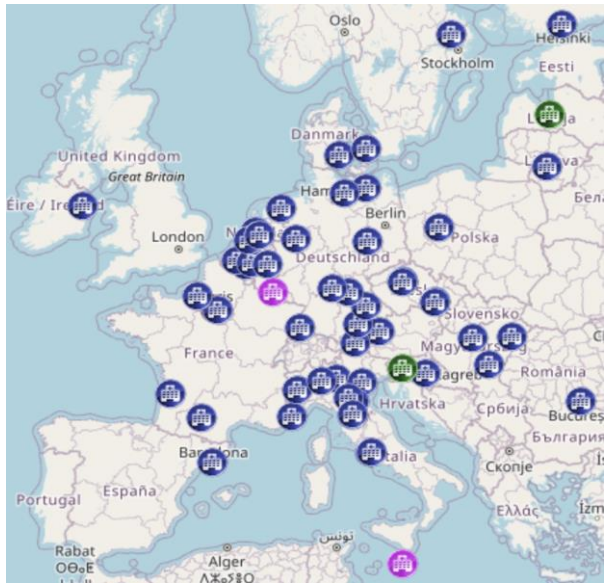
Research & Registry

❖ 6 relevant research proposals involving at least two HCPs from two different member states
❖ Participation in 8 projects during the last 5 years
❖ 458 patients enrolled in PETER registry: https://peter.transplantchild.eu/

Overview and key facts – ERN-Skin

ERN-Skin members

- As of November 2023, 56 HCPs in 20 countries are members of ERN-Skin:
  - ✓ 16 Member States with 52 Full Members
  - ✓ 2 Member States with 2 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 16 patient representatives



ERN-Skin disease areas

- Inherited Epidermolysis Bullosa and skin fragility syndromes, Darier, Hailey-Hailey
- Ichthyosis & Palmoplantar Keratoderma
- Ectodermal Dysplasias including Incontinentia Pigmenti and p63-associated disorders
- Mendelian Causes of Connective Tissue Disorders
- Cutaneous Mosaic Disorders - Nevi & Nevoid Skin Disorders and Complex Vascular Malformations and vascular Tumours
- Cutaneous diseases related to DNA Repair Disorders & photosensitivity
- Autoimmune bullous diseases Severe cutaneous drug reactions
- Hidradenitis suppurativa - PAPA, PAPASH, PASH, PASS, SAPHO - Behçet, Degos

Guidelines and care pathways

- 18 guidelines written by ERN-Skin
- 28 guidelines co-authored and endorsed by ERN-Skin
- 8 patient journeys

Education

- 29 webinars organised by the ERN since 2021
- 52 short exchange programs
- 1 ERN-Skin e-training platform accredited by the UEMS
- World Congress on Rare Skin Disease 2022 & 2024

CPMS

- 167 CPMS case discussions since 2019

Research & Registry

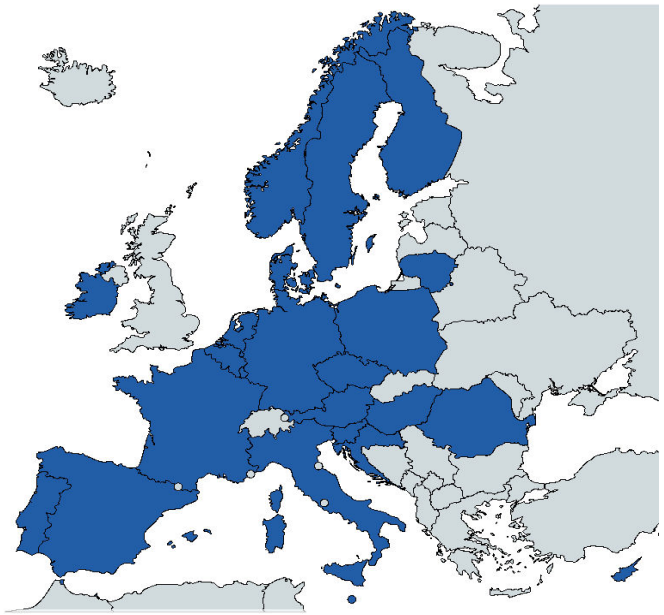
- 78 relevant research projects or clinical trials involving at least two HCPs from two different member states
- 11 patients in the registry. https://ern-skin.eu/erras-registry/

European Reference Network for rare or low prevalence complex diseases
European Reference Networks SKIN

OVERVIEW AND KEY FACTS - VASCERN

ERN VASCERN members

- As of November 2023, 39 HCPs in 19 countries are members of ERN VASCERN:
  - ✓ 14 Member States with 39 Full Members
  - ✓ 3 Member States with 4 Associated National Centres
  - ✓ 2 Member States with a Coordination Hub
- Collaboration with 36 patient representatives



VASCERN disease areas

- Hereditary Haemorrhagic Telangiectasia
- Heritable Thoracic Aortic Diseases
- Medium Sized Arteries (EDS…)
- Neurovascular Diseases (MoyaMoya, Cadasil…)
- Paediatric & Primary Lymphoedema
- Vascular Anomalies (malformations, fistula)

European Reference Network

VASCERN

Guidelines and care pathways

- 8 guidelines co-authored and 30 endorsed by ERN VASCERN
- 9 care pathways
- 0 patient journeys
- 13 consensus statements

Education

- **19** webinars organised by the ERN since 2020
- **61** pills of knowledge produced by the ERN since 2018
- **1** ERASMUS+ Summer School organised since 2024
- **53** short exchange program
- Other relevant training activity: **3** e-learning courses

CPMS

- 274 CPMS case discussions since 2017

Research & Registry

- 24 research projects or clinical trials involving at least two HCPs from two different member states
- 3030 patients in the registry.

European Reference Networks

ERNs – SUCCESS STORIES

Co-funded by the EU

ERKUCATION: FIRST STRUCTURED ERN POSTGRADUATE CURRICULUM - ERKNET

Clinical experience

2 years
in the field of
rare kidney diseases

Webinars

3 years
every 2 weeks

including
Webinar-related
exams

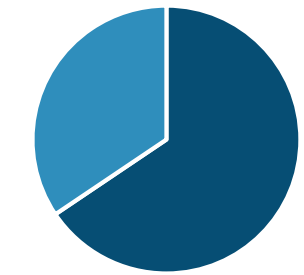
54 topics
pediatric &
adult diseases

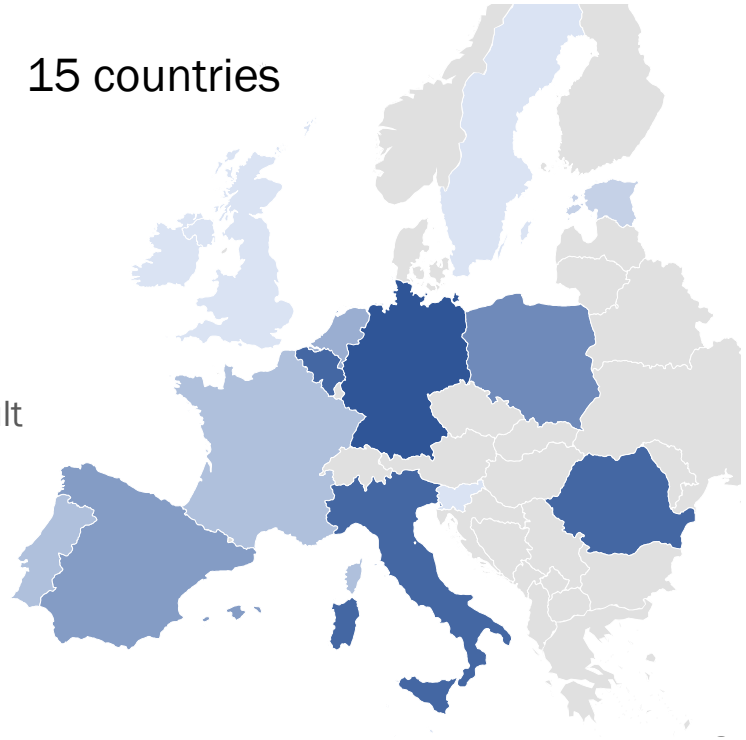
Requirements:
Attendance to 80% of ERKnet Webinars
≥ 75% correct answers in the exams

eLearning cases

topic related
cases
basic &
complex tests

Requirements:
Processing of 80% of all cases
≥ 75% correct answers





4 Classes: 347 students from 65 ERKNet HCPs in 22 countries
| 104 webinars | 31 eLearning cases | 8 workshops / CME courses

First class graduated in 12/2023:
63 „European Rare Kidney Disease Specialists“

THE FIRST ACCREDITED E-LEARNING PROGRAMME ON IMDs - METABERN

Diagnostic, Clinical & Therapeutic Education Programme

on Inherited Metabolic Disorders

Created by the

European Reference Network | MetabERN
European Reference Network for Hereditary Metabolic Disorders

Accredited by the

European Accreditation Council for Continuing Medical Education (EACCME)

11 Modules, **27** Web lectures, **17** EACCME credits.

- **Over 600 registered learners** since the launch of the DCTEP on 19 June 2023 from **70 countries;**
- **50 learners** have completed the entire programme;
- **Over 210 learners** have completed at least one module.

Number registered learners

1 — 80

LEARNERS' STORIES

There were some hours really well spent, I felt like participating to an international congress, but in the quiet of my home, taking notes, rewinding and listening again

CRISTINA POPESCU

PAEDIATRICIAN

The extensive range of subjects covered by the DCTEP provide a good basic knowledge on metabolic pathways, the diseases that may affect these pathways, as well as the work-up of common presenting symptoms

MARK WIJNEN

INTERNAL MEDICINE RESIDENT

CPMS based Cross-Border healthcare pathways in ERN-RND

(323 case discussions since 2017)

- **Neurorehabilitation**

confirming shared guidelines or discussion where no experience is known for best decision making

- **MLD treatment eligibility panels**

High-risk & high-cost: gene therapy/stem cell transplantation

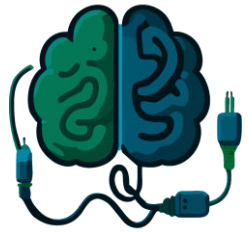
Collaboration with MLDi, (registry of treatment outcome/natural history); Lead: Amsterdam, NL

the MLD initiative

- **DBS for Dystonia**

Homogenization of a highly specialised, invasive treatment.

Lead: Würzburg, DE



- **Disease Group specific**

Consultations & best practice: Diagnosis, Disease management.

Cases clustered by the 6 ERN-RND disease groups

unsolved/complex cases

- **Neuroradiology advice**

Standard pathway for receiving second opinion on imaging findings by neuroradiology experts

Lead: Lübeck, DE

Development of future pathways
e.g. treatment eligibility for further gene therapys

EURACAN SUCCESS STORY - VIRTUAL MULTIDISCIPLINARY TUMOUR GROUPS (MDTs)

EURACAN provides financial support to MDTs to review complex or very rare patient cases registered on the **Clinical Patient Management platform** (CPMS).

By bringing together leading experts in different countries the goal is:

- to discuss **cases of rare adult solid cancers**
- **to consider all perspectives and give timely and accurate diagnoses**
- to increase access to novel treatments and clinical trials.

As of September 2024, the Network reviewed 286 rare adult patient cases

THE EXAMPLE OF THE RARE GYNECOLOGICAL CANCER GROUP

260 patients cases reviewed since 2017

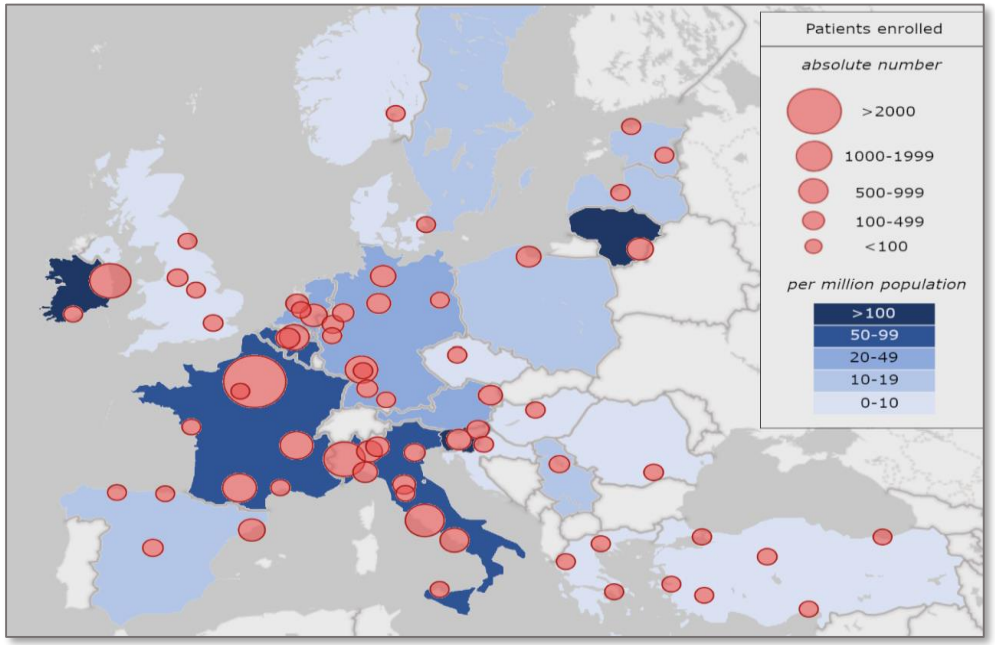
- Impact of these Tumour Boards on patient care[1]:
  - Number of reviewed patients doubled over 6 years
  - **Further diagnostic testing** in 1/3 of patients
  - **New treatment opportunities** to those originally planned for **50% of patients**
  - **Adherence** to these treatment recommendations **94%.**
  - Surveillance instead of adjuvant chemotherapy was recommended in 17% of patients
  - **37 patients** gained access to **off-label therapies**, 4 were enrolled in clinical trials abroad

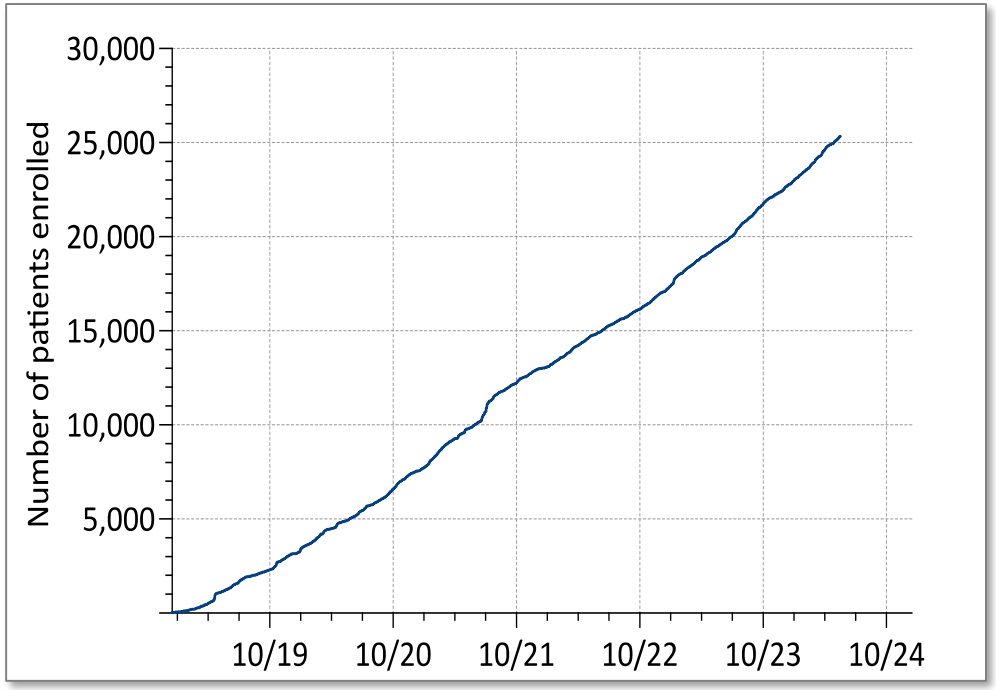
Patients could access off-label therapies not yet approved for rare gynaecological cancers, which would otherwise not have been accessible in some countries.

[1] *Alice Bergamini, ESMO Gynaecological Cancers Congress 2024 #ESMOGynae24, Abstract 82MO*

ERKReg The European Rare Kidney Disease Registry

- Centralized online registry
- **Modular concept**: Core registry and disease-specific subregistries
- >26,00,500 patients enrolled since 1/2019 in **109 specialized units in 25 countries**
- 60% pediatric and 40% adult patients
- **100 new patients added per week**
- Annual follow-up achieved in 75%
- **Key performance and outcome monitoring system**





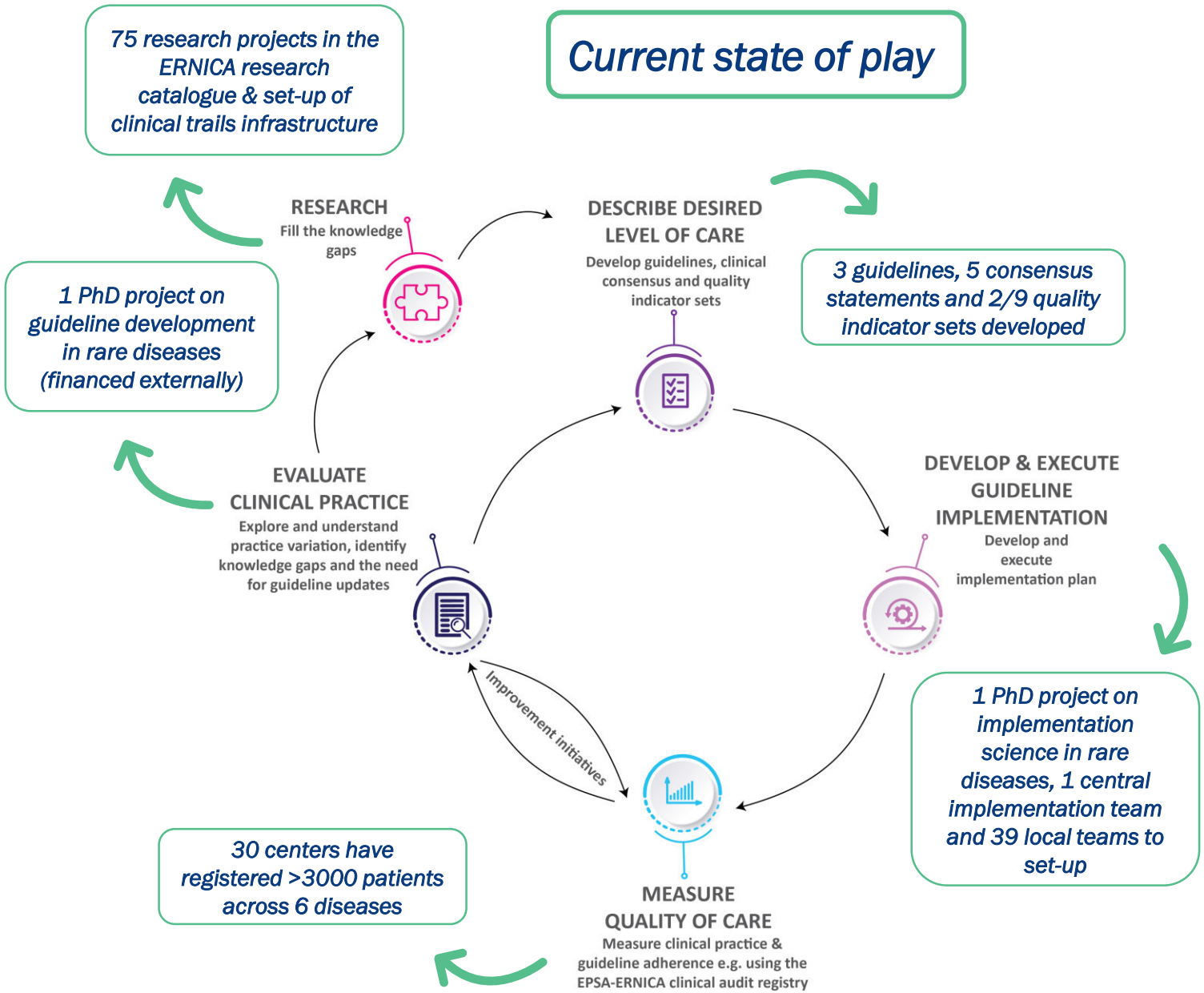
www.registry.erknet.org

Bassanese et al. Orphanet J Rare Dis (2021)
https://doi.org/10.1186/s13023-021-01872-8

ERNICA Quality Cycle

- Aim of European Reference Networks = to share, care & cure

- ERNICA has developed its own **quality cycle** to meet these aims, involving guideline development, implementation, evaluation in the patient registry and fill knowledge gaps in research ➔ ongoing process



GUIDELINES/CARE PATHWAYS - EPICARE

A DEDICATED WG ON NATIONAL HEALTHCARE PATHWAYS IN EPILEPSY CARE

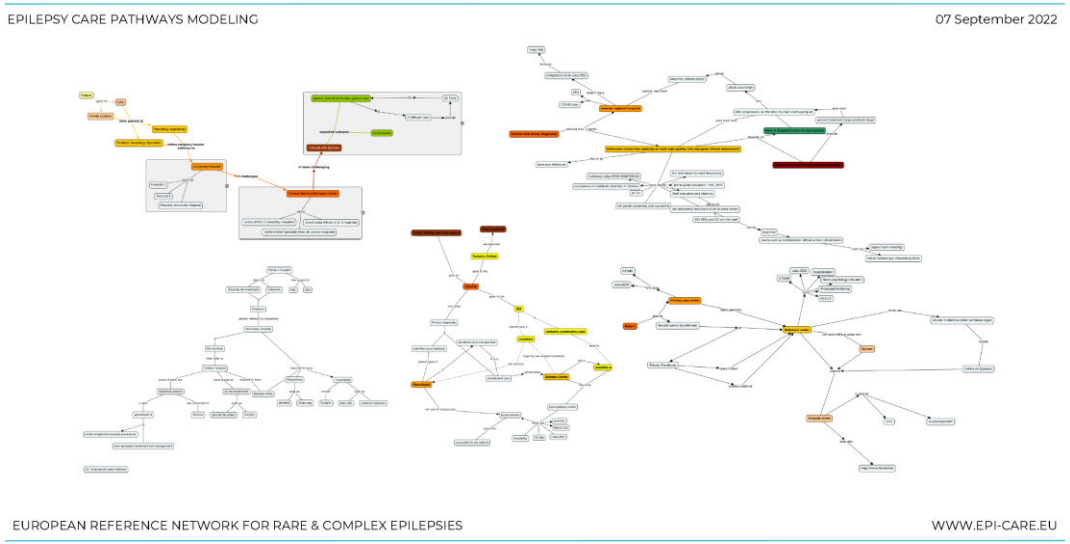
Initiated in 2021 the WG focus on public healthcare issues. Structured interviews of epilepsy leaders demonstrated that epilepsy care pathways differ significantly across EU countries, indicating the urgent need for a more structured approach.

The WG is now preparing a Delphi study to reach consensus on optimal healthcare pathways for patients with epilepsy and an evidence-based definition of Level II and Lever IV reference center characteristics

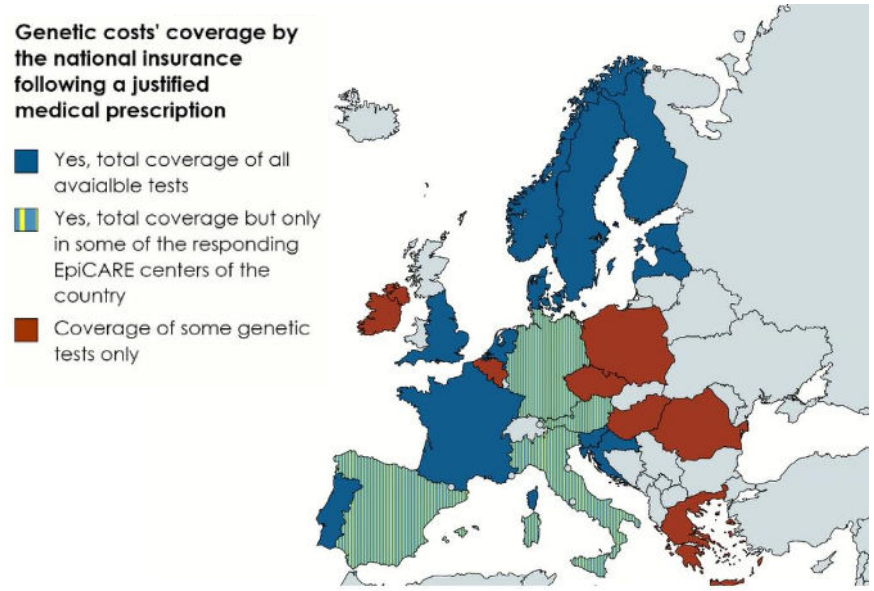
INEQUALITIES IN ACCESS TO CARE:

EpiCARE performed and published a study on accessibility, availability and costs within the EU, related to genetic testing for rare epilepsies (DOI: 10.1002/epi4.12930). Differences are significant indicating the urgent need for concrete and concerted actions.

The ERN EpiCARE initiated and signed **a Memorandum of Understanding with all epilepsy-related scientific societies** (International League Against Epilepsy; European Academy of Neurology; European Paediatric Neurology Society) for **a shared production of Guidelines and Recommendations**.



"Illustration of differences in healthcare pathways in EU countries"



EpiCARE

European Reference Network for rare or low prevalence complex diseases

GUIDELINES AND CARE PATHWAYS – ERN LUNG

- 3 level approach to cross-border care even for Undiagnosed patients (Working group w/ JARDIN)
- Level 1- EXABO Online expert advice
- Level 2 – CPMS Panel discussion
- Level 3 – Cross-border referral

BREATHeREGISTRY

Population registry – Patient oriented, voluntary entering of patient details by patients.

July 2024 – 160 newly entered patients

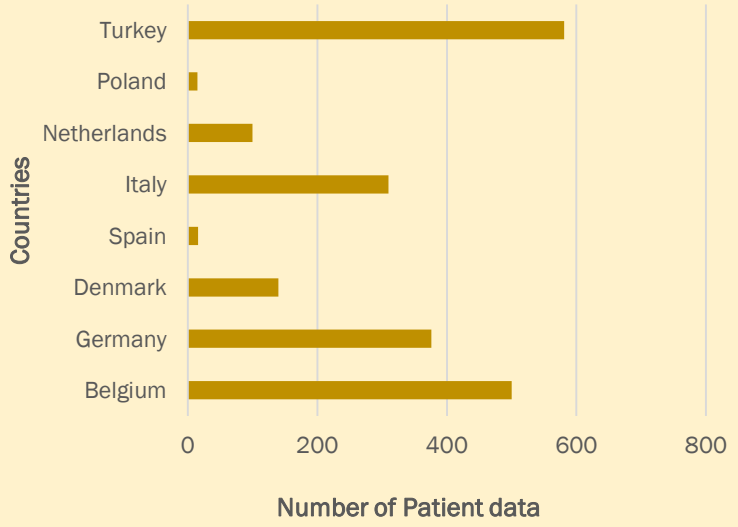
Guidelines and Patient Pathways

- 6 guidelines endorsed by ERN LUNG
- 109 publications by ERN-LUNG members
- Patient journeys for 4 ERN-LUNG disease areas
- Patient Priorities project for 3 core networks (SARC, ILD, BE)

- Patient Pathways available for CN:
  - Idiopathic Pulmonary fibrosis
  - Pulmonary Hypertension
  - Sarcoidosis
  - Primary Ciliary Dyskinesia

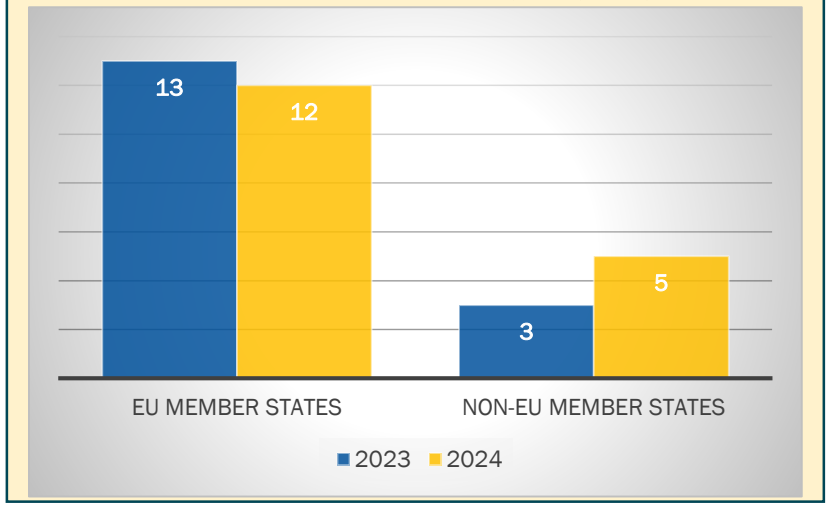
ERN-LUNG PRIME Registry

- Approx. 2000 patients in registry



ERN-LUNG Academy

- 2023 – 43 participants
- 2024 – 41 participants
- 2025 – Recruiting ongoing



Clinical Trial Network

9 research projects supported, and 3 core networks supported CF, AATD, PCD) implemented CTN. Others like BE, PH are in early phase.

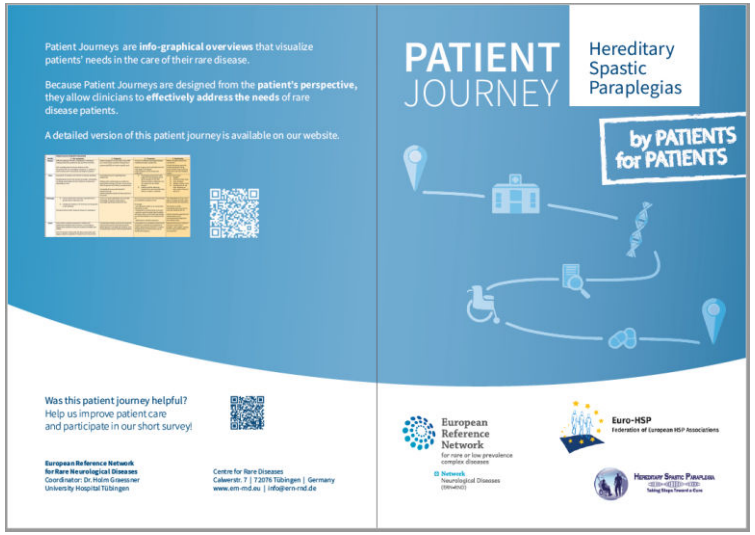
Go East Initiative

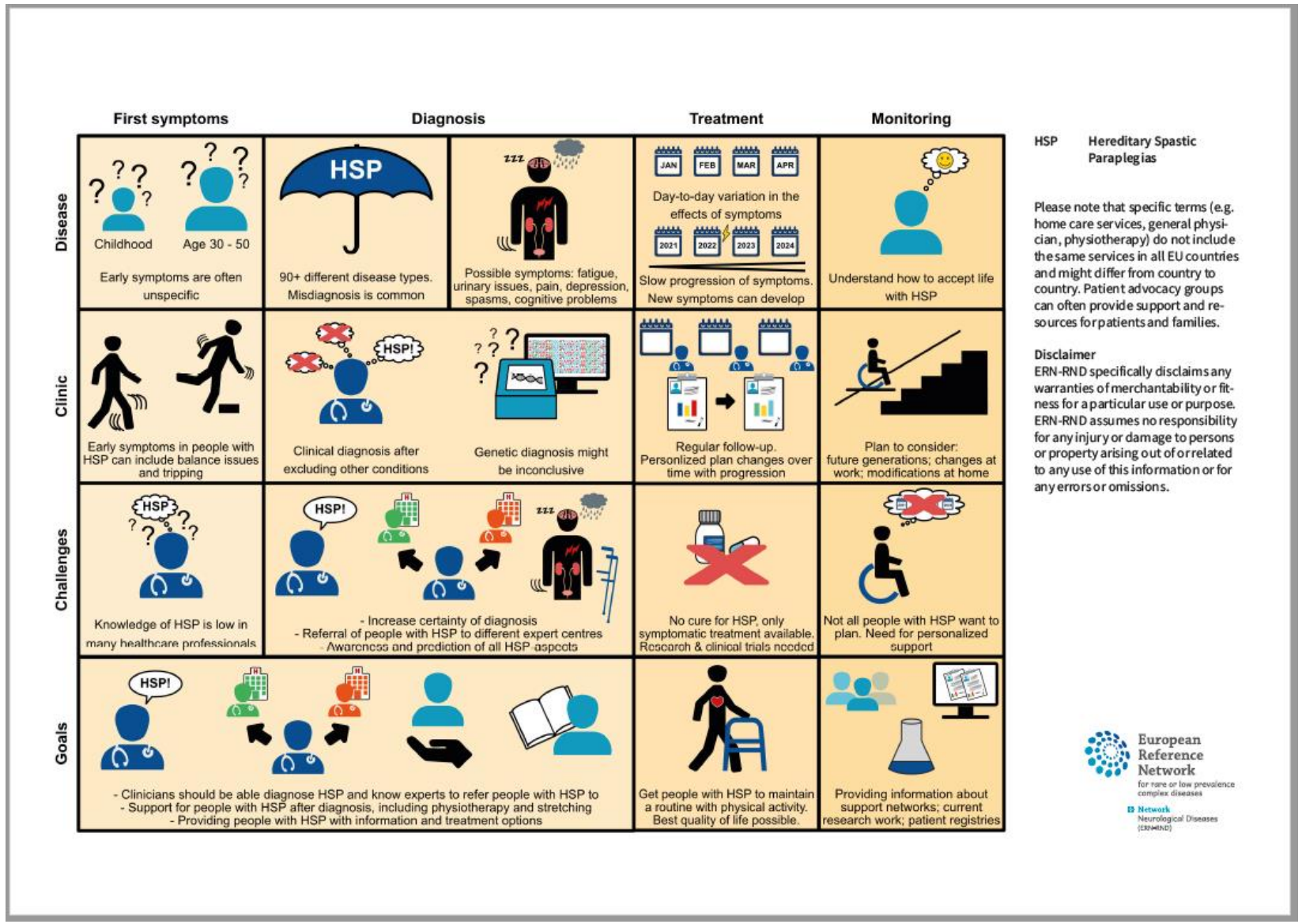
Initiative to involve under-represented Eastern European countries in ERN-LUNG. Interested HCPs located in Romania, Hungary, Slovakia.

European Reference Network
for rare or low prevalence complex diseases
Network Respiratory Diseases (ERN-LUNG)

PATIENT JOURNEYS – ERN-RND

- 5 patient journeys available and 3 in development
- Main European languages
- **Goal:** hand out a suitable patient journey to all newly diagnosed patients

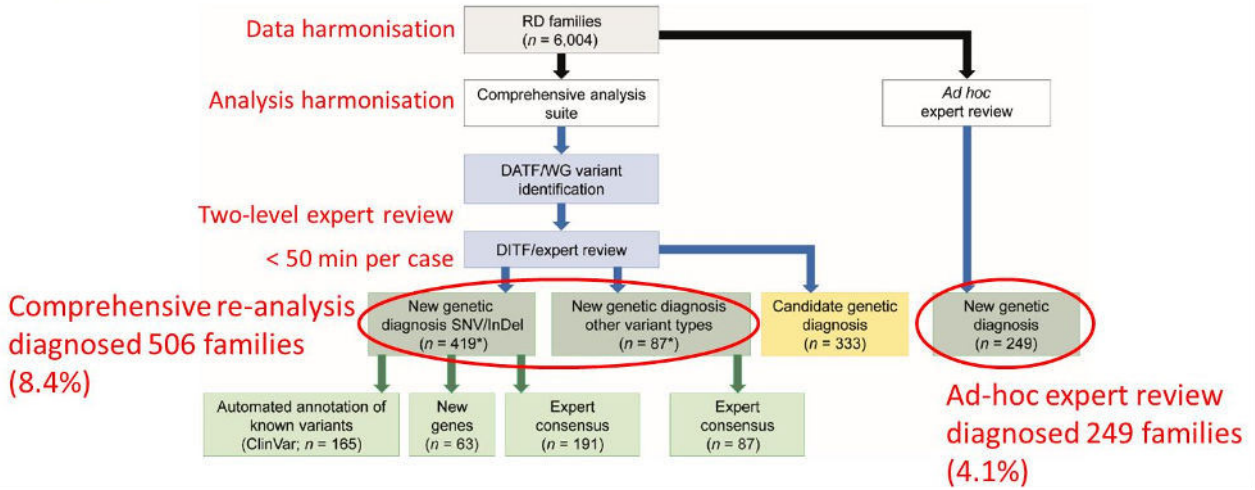




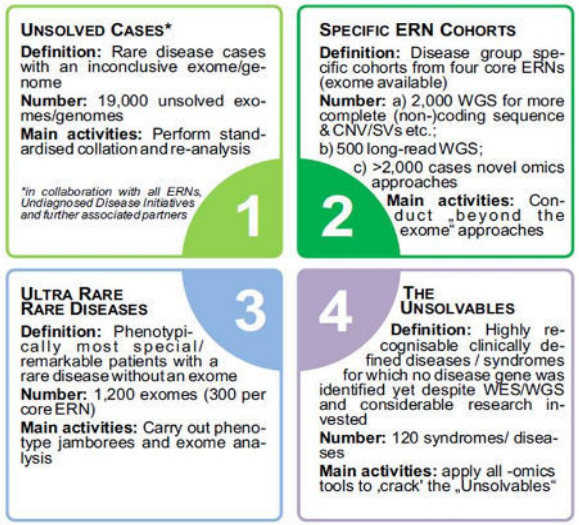
SOLVE-RD. ERN-BASED DIAGNOSTIC COLLABORATIVE RESEARCH (WWW.SOLVE-RD.EU)

- Solve-RD network contains six ERNs: RND, NMD, ITHACA, Genturis, EpiCare, Rita
- Proven value of ERN-based systematic cutting-edge diagnostic research
- Analysis framework combined with a two-level expert review is a practical blueprint for re-analysis efforts on a global scale

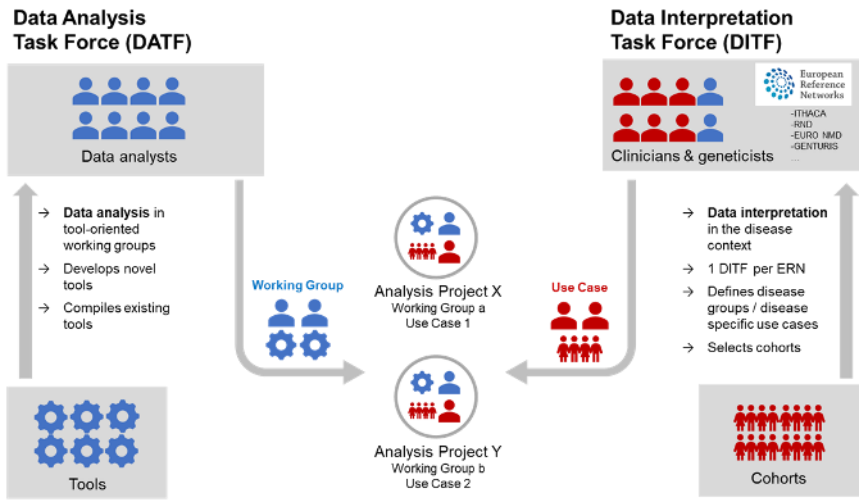
Re-analysis: yield



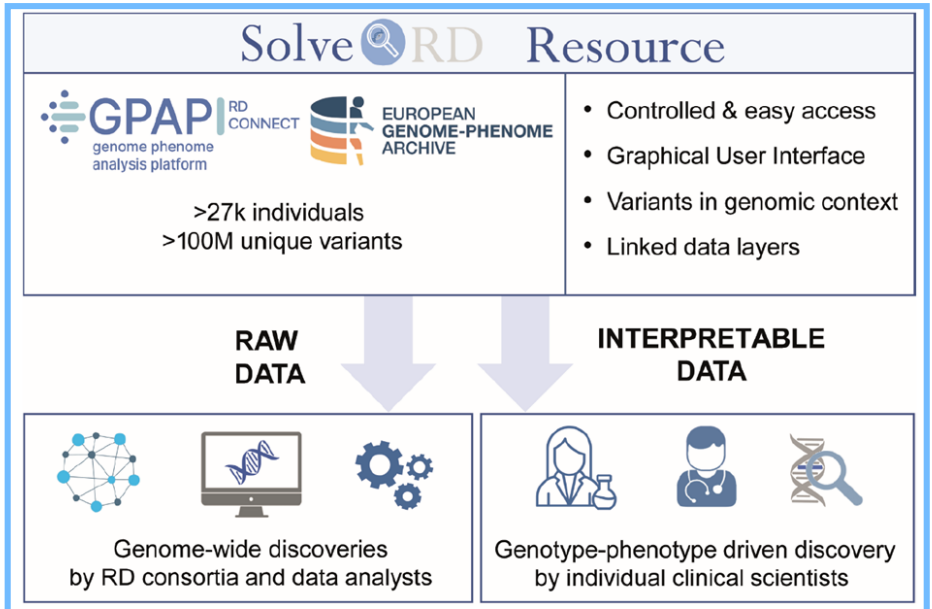
Solve-RD cohorts



Solve-RD data analysis organisation



Solve-RD Resource



RESEARCH - ITHACA

- Elevating Care and Research in Genetic NeuroDevelopmental Diseases (NDD), a Great Success
  - Second-of-its-kind European workshop focused on the complex care and research of genetic neurodevelopmental disorders.
  - Over 250 experts including clinicians, patients, and researchers from across Europe
  - Held at the University Institute of Lisbon (ISCTE), April 4-5, 2024
  - Highlights of interdisciplinary collaboration and patient-centric approaches that led to practical innovations in diagnostics and therapies
- EuroNDD 2024 aligned with and supported by ERN ITHACA's ongoing initiatives to enhance patient care across Europe

PATIENT EMPOWERMENT - RARE-LIVER YOUTH PANEL

"We focus on improving medical care for young patients and strive to make their journeys easier by supporting, connecting and accepting."

10-15 young people with rare liver diseases (aged 18-30 years)

Meeting at least 6 times per year online and once in person

Closely involved in activities of ERN RARE-LIVER and the transition working group, participate in workshops, online meetings and development of guidelines

Decisions are made together, within the Youth Panel

- To represent the **interests of young people** and to create awareness especially in young professionals.
- To be **role models** and mentors for younger patients.
- To **connect** young people with rare diseases.

European Reference Network for rare or low prevalence complex diseases

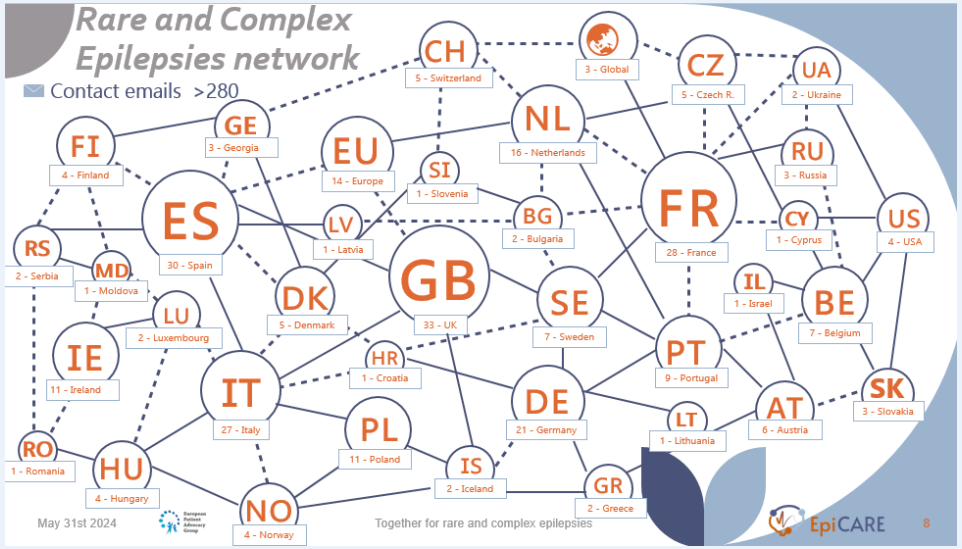
ERN RARE-LIVER

PATIENT EMPOWERMENT - EPICARE

EPILEPSIE(S) PATIENT ADVOCATES

Because of the major differences, in care and prognosis, between the different types of the epilepsies, patient representation has always been highly complex and challenging.

Despite those difficulties the EpiCARE patient advocates group succeeded in initiating partnership links with several associations across Europe.



PATIENT JOURNEY AND LEAFLETS TRANSLATIONS

EpiCARE experts together with patient representatives already produced a significant number of aetiology-specific leaflets, with information for caregivers but also for family doctors. They also take care to translate them into as many languages as possible to reach a widest audience.

Rare epilepsies Leaflets

Patient and caregivers leaflets are developed to give precise and accessible informations on rare and complex epilepsies. With **one part for healthcare profesionnals, and one part for patients and their families or carers**, these documents detail comprehensively what to expect when facing a rare epilepsy, and how to manage care.

Unless mentioned otherwise, all leaflets are in english. We are working on translating them in as many languages as possible with the help of patients associations all over Europe, so check back regularly!

Here you can download Leaflets in different languages:

Patients & caregiver leaflets

European Patient Advocacy Group

- **Dravet Syndrome**

Versions: English (EN) / Italiana (IT) /Română (RO) / Hrvatska (HR) / Deutsche (DE) / Norsk (NO) / Srpska (RS) / Svensk (SE)

- **Hypothalamic Hamartoma**

Versions: English (EN) / Roman (RO) / Hrvatska (HR)

- **Ring Chromosome 20**

Versions: English / Hrvatska (HR) / ελληνική έκδοση (GR) / Lietuviška (LT)

- **Alternating Hemiplegia of Childhood**

Versions: English (EN) / Hrvatska (HR) / Italiana (IT) / Española (ES) / Française (FR)

- **GLUT1 Deficiency Syndrome**

Versions: English (EN) / Hrvatska (HR) / Română (RO) / Deutsche (DE) / Italiana (IT)

- **CDKL5 Deficiency Disorder**

Versions: English (EN) / Española (ES) / Portuguesa (PT) / Hrvatska (HR) / Română (RO)

- **Lennox-Gastaut Syndrome**

Versions: English (EN) / Română (RO) / Hrvatska (HR)

- **SYNGAP1**

Versions: English (EN) / Română (RO) / Hrvatska (HR)

- **RETT Syndrome**

PATIENT JOURNEYS & LEAFLETS

PATIENT EMPOWERMENT: OPEN DIALOGUE BETWEEN PATIENTS AND CLINICIANS

Workshop: "Patient priorities in ERN BOND beyond Quality of Life Provision of care to RBDs patients"

4 topics explored in the rare bone disease area:

- Pain management
- Pregnancy
- Movement/Functional limitations
- Transition from pediatric to adult

Commentary paper on the workshop results under submission

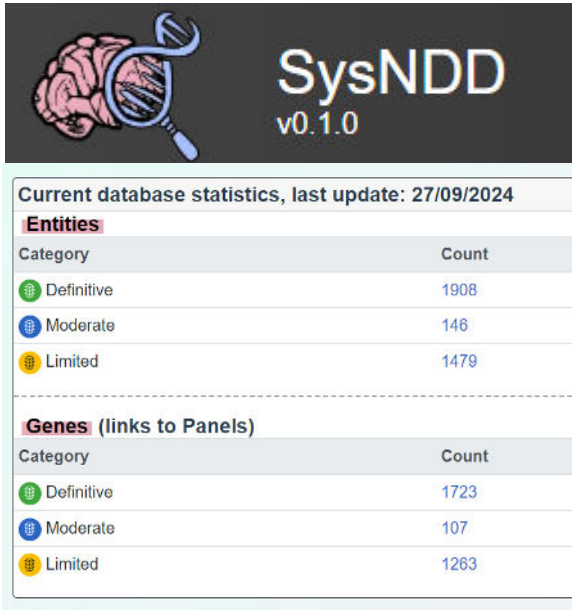
Publication "Defining priorities in the transition from paediatric to adult healthcare for rare bone disease patients: a dialogic approach" in the ERN BOND special issue in EJMG (Scognamiglio et al., 2024)

First author, a rare bone disease patient, awarded as "*Italian Health Champion*" aiming to valorize important scientific achievements in the biomedical field

SUPPORT TO ORPHANET - ITHACA

- Orphanet is represented in ITHACA's board

- Orphanet summaries
  - Each HCP is invited to collaborate with ORPHANET to create or update entries of the European catalogue for (neuro)developmental disorders
  - Orphanet proposes yearly a list of missing/outdated summaries that are delivered on a voluntary base by ITHACA members
  - Over 80 contributions online since 2020
- Link between Orphanet and the SysNDD database
  - SysNDD is a database of genes involved in Intellectual disability and Autism
  - ITHACA support SysNDD, its curation and funded the link between Orphanet and SysNDD for the list of non-syndromic ID genes (over 2000)
- Orphanet nomenclature & HPO ontology
  - ITHACA has contributed to several updates in the ontology used by ORPHANET, based on Human Phenotypic Ontology database
  - Main contributions are in the field of fetal pathology and recent update in the classification of spinal dysraphisms



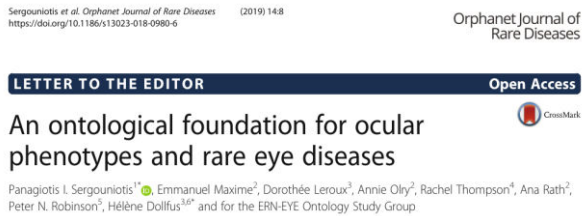
ORPHANET AND HPO REVISION – ERN-EYE

- **Meetings**

→ 3 meetings already took place: December 2023 & February 2024 in Strasbourg & July in Amsterdam

- **Revision and follow-up on ontologies**

→ since 2018 (ERN-EYE meeting in Mont Ste-Odile, France)



Sergouniotis et al. Orphanet Journal of Rare Diseases (2019) 14:8
https://doi.org/10.1186/s13023-018-0980-6

Orphanet Journal of Rare Diseases

LETTER TO THE EDITOR — Open Access

An ontological foundation for ocular phenotypes and rare eye diseases

Panagiotis I. Sergouniotis[1*], Emmanuel Maxime[2], Dorothée Leroux[3], Annie Olry[2], Rachel Thompson[4], Ana Rath[2], Peter N. Robinson[5], Hélène Dollfus[3,6*] and for the ERN-EYE Ontology Study Group

- **Context**

→ Development of a registry for Rare Eye Diseases (REDgistry)

- **Context**

→ Improvement of genetic diagnosis

OUTCOMES WILL BE INTEGRATED IN THE CURRENT ORPHANET CLASSIFICATION & HUMAN PHENOTYPE ONTOLOGY (HPO)

human phenotype ontology

orphanet

Cancer & Family Care for Ukraine Childhood Cancer Patients - PaedCan

As of September 10, 2024, the European Paediatric Oncology Community (SIOPE, CCI-E and many ERN PaedCan Sites) **assisted 1643 Ukrainian pediatric cancer patients** through the SAFER (Supporting Action for Emergency Response) Ukraine program (St. Jude).

- The following countries have accepted the following number of patients under their care since 2022:

❖Poland > 400 patients	❖Spain > 80 patients	❖Austria, Belgium, Romania, Slovakia: 10 - 20 patients each
❖Germany > 250 patients	❖Czech Republic > 70 patients	❖Bulgaria, Croatia, Denmark, Lithuania, Portugal, Sweden: 1- 6 patients each
❖ Italy > 200 patients	❖Switzerland and France > 60 patients	
❖Netherlands > 100 patients	❖ United Kingdom: over 20 patients	

- 724 patients were directly evacuated through the SAFER Ukraine referral pathway.
  The other patients received support e.g. through translation of medical records.
- **This data does not include patients and families who left Ukraine seeking care on their own/through other pathways. The total number of patients who left Ukraine is estimated > 2000 childhood cancer patients**.

After the attack on July 8th , 2024 to the Okhmatdyt National Children´s Hospital in Kyiv, Ukraine, acute evacuation of paediatric cancer patients was needed again. ERN PaedCan members closely collaborated with SAFER Ukraine a/o directly with European National Health Ministries supporting the safe evacuation of **13 patients**:

❖Germany = 7 patients	❖Switzerland = 2 patients	❖Austria = 4 patients

UKRAINE – ERN-EYE

Creation of the ERNs website erncare4ua.eu and a logo

European Reference Networks

#ERNcare4Ua

Rare Diseases Doctors

Short paper published in The Lancet Regional Health

Contact with Ukrainian clinicians to identify their needs

Launch of an ERN workgroup

UKRAINE - EPICARE

European Reference Networks

#ERNcare4Ua
Rare Diseases Doctors

EPICARE WITH UKRAINE WAR

EpiCARE is officially represented at the “Emergency and Crisis Response Task Force” for Ukraine, created by the International League Against Epilepsy.

Monthly calls and direct contact with epilepsy experts and patient advocates in Ukraine.

A dedicated webinar was organized by EpiCARE with invited speakers from Ukraine.

Managing Epilepsies in Crisis Situations – The Ukraine Experience

March 21, 2024 5:00 pm

Andriy Dubenko, Volodymyr Kharytonov

See the video

EMERGENCY TASK FORCE ACTIVITIES https://www.ilae.org/files/dmfile/emergency-and-crisis-task-forces-annual-report-2023.pdf

During 2023 – 2024 the Task Force met at least once per quarter and completed the following projects:

- Drafted a suggested process for identifying crisis or emergency situations that may require a response
- Assisted in the transfer of emergency or crisis response information from the Ukraine portion of the ILAE and EpiCARE websites to the crisis response section
- Reviewed material on the crisis response webpage for completeness or correction
- Developed and presented a seminar on emergency response during the 35th International Epilepsy Congress held in Dublin, Ireland in 2023 and the European Epilepsy Congress held in Rome in 2024.

IMPACT ON PATIENT CARE – SUCCESS STORY

COVID-19

Received: 29 May 2020 | Accepted: 29 July 2020
DOI: 10.1111/ctr.14063

BRIEF COMMUNICATION

Clinical TRANSPLANTATION WILEY

Pediatric transplantation in Europe during the COVID-19 pandemic: Early impact on activity and healthcare

https://doi.org/10.1111/ctr.14063

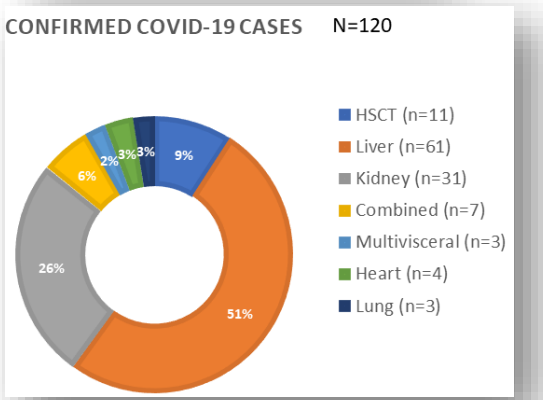
Luz Yadira Bravo Gallego[1,2,3], Mara Cananzi[4], Daniele Donà[5], Elisa Benetti[6], Marta González Vicent[7], Esteban Frauca Remacha[8,9], Paloma Jara Vega[1,8,9], *on behalf of COVID-19 study group of the Clinical Audits Working Group - ERN-TransplantChild.*

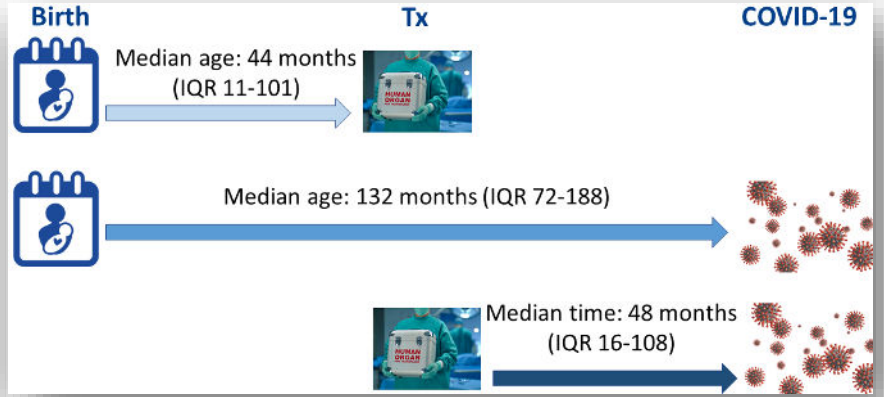
[1]ERN-TransplantChild, La Paz University Hospital, Madrid, Spain; [2]Lymphocyte Pathophysiology in Immunodeficiencies Group, Hospital La Paz Institute for Health Research (IdiPAZ), Madrid, Spain; [3]CIBERER U767, Center for Biomedical Network Research on Rare Diseases, Madrid, Spain; [4]Unit of Paediatric Gastroenterology, Digestive Endoscopy, Hepatology and Liver Transplantation, Women's and Children's Health, University Hospital of Padua, Padua, Italy; [5]Pediatric Infectious Diseases Department, Women's and Children's Health, University Hospital of Padua, Padua, Italy; [6]Pediatric Nephrology, Dialysis and Transplant Unit Department, Women's and Children's Health, University Hospital of Padua, Padua, Italy; [7]Hematopoietic Stem Cell Transplantation Unit, Department of Pediatrics, Hospital Infantil Universitario Niño Jesús, Madrid, Spain; [8]Pediatric Hepatology Department, La Paz University Hospital, Madrid, Spain; [9]Molecular Hepatology Group, Hospital La Paz Institute for Health Research (IdiPAZ), Madrid, Spain.

European Reference Network for rare or low prevalence complex diseases

TransplantChild

- 93% (112/120) were living in an EU-MS:
  - Spain: 27.5%
  - Italy: 26.7%
  - Portugal: 11.7%
- 61.7% (74/120) were male.





Conclusions

- This study reports one of the largest series of COVID-19 in pediatric transplant recipients.
  - The importance of being a member of scientific associations or networks, like the ERN-TransplantChild.
- While this population is theoretically more at risk for severe illness from SARS-CoV-2 infection due to ongoing immunosuppression and/or compromised immune system, our data show that, in this patient group, COVID-19 is mainly asymptomatic or mild, and seldom associated with patient death or graft loss.

COVID-19: Helpline for Rare Bone Diseases

COVID-19 Helpline (24/7)
for supporting patients with rare bone diseases and centres during COVID-19 emergency

This successful experience highlighted the fundamental role of remote high quality of care for RBDs during the COVID-19 outbreak that could become a **gold-standard practice for remote care**, particularly relevant for RBD patients.

Irish Journal of Medical Science (1971 -) (2021) 190:1243–1244
https://doi.org/10.1007/s11845-020-02400-6

LETTER TO THE EDITOR

The line between COVID-19 pandemic and rare bone diseases

Luca Sangiorgi[1,2] · Evelise Brizola[1] · on behalf of the COVID-19 Helpline for Rare Bone Diseases Group

Received: 23 September 2020 / Accepted: 15 October 2020 / Published online: 2 November 2020

The recent outbreak of COVID-19 pandemic had a dramatic global impact for healthcare systems and required a rapid re-arrangement of the priorities. In Europe, a disease is defined as rare when it affects no more than 5 in 10,000 people [1]. Between 6000 to 8000 distinct rare diseases exist today affecting around 6–8% of the population—over 30 million people in Europe are directly involved [2], which number is close to the number of people currently affected with COVID-19 glob-

Helpline for Rare Bone Diseases" [5]. The purpose is to provide experience and knowledge about RBD to patients and healthcare professionals working in the intensive care units and/or COVID-19-devoted wards who are treating or will treat patients affected by RBD, initially focusing on patients with osteogenesis imperfecta. For all patients with RBD, it is crucial to know that they can constantly rely on their primary care physicians and keep these professionals informed about their

Sangiorgi et al., 2021

POSITION STATEMENT Open Access

Providing high-quality care remotely to patients with rare bone diseases during COVID-19 pandemic

E. Brizola[1], G. Adami[2], G. I. Baroncelli[3], M. F. Bedeschi[4], P. Berardi[5], S. Boero[6], M. L. Brandi[7], L. Casareto[1], E. Castagnola[8], P. Fraschini[9], D. Gatti[2], S. Giannini[10], M. V. Gonfiantini[11], V. Landoni[12], A. Magrelli[13], G. Mantovani[14,15], M. B. Michelis[6], L. A. Nasto[6], L. Panzeri[5], E. Pianigiani[1], A. Scopinaro[16], L. Trespidi[17], A. Vianello[18], G. Zampino[19] and L. Sangiorgi[20*]

Abstract

During the COVID-19 outbreak, the European Reference Network on Rare Bone Diseases (ERN BOND) coordination team and Italian rare bone diseases healthcare professionals created the "COVID-19 Helpline for Rare Bone Diseases" in an attempt to provide high-quality information and expertise on rare bone diseases remotely to patients and healthcare professionals. The present position statement describes the key characteristics of the Helpline initiative, along with the main aspects and topics that recurrently emerged as central for rare bone diseases patients and professionals. The main topics highlighted are general recommendations, pulmonary complications, drug treatment, trauma, pregnancy, children and elderly people, and patient associations role. The successful experience of the "COVID-19 Helpline for Rare Bone Diseases" launched in Italy could serve as a primer of gold-standard remote care for rare bone diseases for the other European countries and globally. Furthermore, similar COVID-19 helplines could be considered and applied for other rare diseases in order to implement remote patients' care.

Keywords: 2019-nCoV, Bone diseases, Care, Coronavirus, COVID-19, ERN, Rare diseases, Remote

Brizola et al, 2020

INTER-ERN COOPERATION – ERN BOND

HRpQCT

Feasibility study the potential applications of HRpQCT (High Resolution peripheral Quantitative Computed Tomography) in bone disorders related to endocrine conditions

Education and Training Survey: A Collaborative Effort enhancing education in Rare Bone diseases

Mapping of education and trainings needs and gaps in rare bone and mineral diseases in ERN BOND and EndoERN to eventually develop a comprehensive cross-border educational programme in rare bone and mineral diseases.

Preliminary phase development of molecular diagnostic tests in collaboration with MetabERN

Diagnostic characterisation of Ollier's disease

Joint Meeting EndoERN, ERKNet, ERN BOND. **"Phosphate Imbalance Disorders: Dysregulation of the FGF23A Endocrine System. Holistic management of the disease"**
The Italian members of these three ERNs together with experts in X-linked hypophosphatemia (XLH) met with the aim of improving access to quality healthcare for XLH patients.

Joint Meeting EndoERN, ERKNet, ERN BOND

INTERERN COOPERATION – EURO-NMD

- The interERN Gene therapy webinar series

  The Gene therapy webinar series, led by EURO-NMD and co-organized with ERN-RND and EpiCARE, featured 14 expert speakers from 8 countries* and included 12 sessions focused on sharing lessons learned and practical implications relevant to all diseases of interest to the participating ERNs.

  *Spain, UK, Germany, USA, Netherlands, Canada, Italy, France

- The interERN Survey on Gene therapy practices in Europe

  This survey aimed to assess the current landscape of gene therapies in Europe, focusing on access conditions, organizational aspects, and clinical decision-making processes. The findings are intended to improve and harmonize practices, potentially leading to initiatives such as the establishment of treatment eligibility boards for gene therapies, with a focus on diverse disease groups.

  It was disseminated to the 5 participating ERNs (EURO-NMD, ERN-RND, EpiCARE, ERN-EYE, MetabERN) as well as centers in Ukraine, UK and Switzerland.

  185 responses were collected from 27 countries (61 EURO-NMD, 42 RND, 31 EYE, 25 EpiCARE, 25 MetabERN).

- The interERN Guideline on safe medication in mitochondrial epilepsy

  5 ERNs; 24 European experts addressed a cross-disease challenge and provided a guideline to solve a treatment dilemma (PMID: 38576261)

MULTIDISCPLINARY TEAM - EPICARE

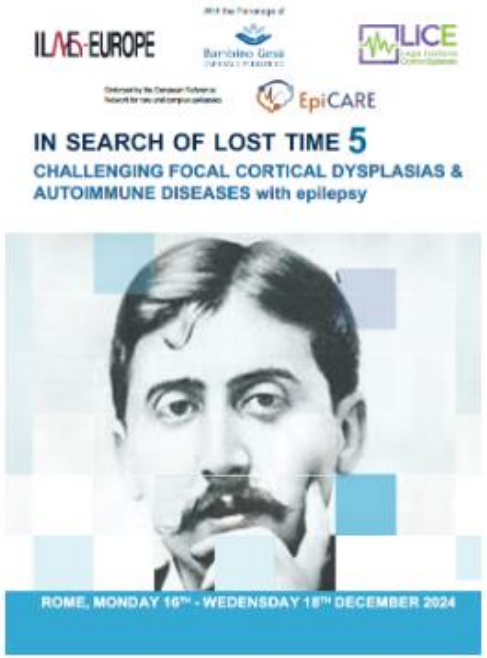
EU NETWORK OF NURSES, EEG TECHNICIANS & PARAMEDICS

Nurses, EEG technicians and neuropsychologists play an essential role in epilepsy care. For this reason, EpiCARE **reserved the first Exchange Program funded by the EU to those disciplines**. A workshop on exchange of local practices was held in 2023 leading to the creation of an EU network of NURSES and EEG Technicians involved in epilepsy care.

IN SEARCH OF LOST TIME

We are at the 5th edition of a multidisciplinary annual 3 days workshop “In search of Lost time” focusing on ne knowledge in the field.

Organized by the Italian EpiCARE members it is held in Rome and systematically involves next generation experts, researches, senior clinicians and patient advocates.



EpiCARE STRUCTURE

The need for a multidisciplinary care in epilepsy is reflected in the ERN EpiCARE structure.

WGs per discipline or field of expertise regularly interact to ensure a multidisciplinary approach of best practices in epilepsy care.

Work with EpiCARE for
Standards & Best practices

- WG 2 Clinical Genetics & Orphacodes
- WG 4 Clinical Neuro-physiology
- WG 6 E-neuropathology
- WG 8 Pre-Surgical eval. & Surgery
- WG 3 Neuroimaging
- WG 5 Neuropsychology
- WG 7 Targeted medical therapies & Trials
- WG 9 Neonatal seizures and epilepsies
- WG 20 Nurses & EEG technicians

EpiCARE
European Reference Network
for rare or low prevalence complex diseases

Drug access /availability – A Joint Effort to Ensure Access to treatments for patient – ERN BOND

During the **ERN BOND Italia meeting**, the healthcare professionals highlighted critical shortages and unavailability of essential drugs and diagnostic agents

Once the needs were identified from each Italian HCP, ERN BOND engaged **AIFA** (Italian Medicines Agency) to discuss potential solutions and guarantee access to essential treatments and diagnostic agents for patients with rare diseases.

Following the meeting with AIFA, two supply solutions were identified

Importation: Via the USMAF (Maritime, Air, and Border Health Office), following the rules outlined in the Italian Ministry Degree of 11/02/1997.

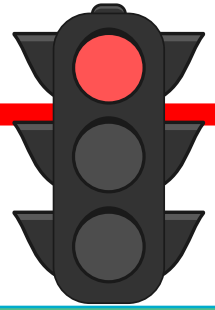
Galenic production: Sifap (Italian Society of Compounding Pharmacists) can produce these medications.

ENSURING DRUG SUSTAINABILITY - METABERN

European Reference Network | MetabERN
European Reference Network for Hereditary Metabolic Disorders

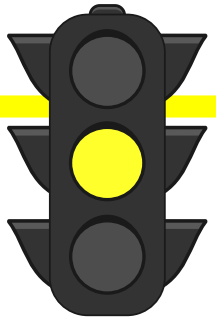
A LIFE SAVING DRUG IS WITHDRAWN

- Cobalamin C defect (CBLC) is a rare congenital disease affecting the metabolism of vitamin B12 (cobalamin), it is lethal if not treated
- Life-saving therapy: daily administration of high dosage of hydroxocobalamin (OHB12)
- In 2022 the marketing of OHB12 was discontinued and a shortage of the drug was recorded
- Patients without treatment are exposed to serious clinical events including death



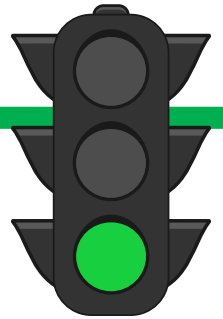
METABERN ITALY TAKES ACTION

- The Italian CBLC APS Patient Organization and the METABERN ITALY TEAM lead by the Bambino Gesù Children's Hospital in Rome join efforts among patient organisations, clinicians and the Italian Medicines Agency (AIFA).
- MetabERN Italy spreads the issue at EU level and a survey is to look for possible alternative therapeutic options.
- Results: the only therapeutic option is a OHB12 10 mg/2 ml which need to be imported in a very limited amount from Spain.



PATIENTS ARE SAFE

- Given the shortage of the drug, the Military Pharmaceutical Chemical Institute of Florence, Italy, committed by law to find solutions in national emergency needs, has taken action to make available new stocks of OHB12, for all families needing treatment.
- The shortage is restored, patients ARE SAFE



Develop Child and Orphan Device Evaluation support for rare diseases

European Reference Network | ERN eUROGEN Rare Urogenital Diseases & Complex Conditions

DeCODe

Aim

1. Support development of paediatric and orphan devices for rare diseases
2. Consortium co-funded by the EC, of academics, developers, clinicians, regulatory experts, funding experts, in-silico testing experts
3. ERN eUROGEN and MetabERN involved

Goal

1. Develop a critical path for orphan device development
2. Provide support to 5 orphan device developers
3. Call for proposals in March 2025

Consortium

1. Academics, developers, clinicians, regulatory experts, funding experts, in-silico testing experts
2. Co funded by EC
3. ERN eUROGEN and MetabERN involved

DeCODe development

1. Concept development
2. Advanced development
3. Device development and prototyping
4. Testing and certification
5. Implementation/Lifecycle management

DeCODe support

1. Business (IP, Needs assessment, Value proposition, Funding)
2. Technology (Proof of concept, Infra testing, Hardware & software, Connectivity)
3. Regulatory (Preparation, Quality assessment)

Pilot cases

1. 5 cases
2. Rare and paediatric
3. Unmet need, potential for significant benefit
4. Off label going towards on label use, de novo development
5. Call open in spring 2025
6. Device developers get min 6 months of support