Diagnosis and care for DMD patients in Hungary

Genetic diagnosis
Patient registry
Patient care practice survey
Budapest Child Neuromuscular Center

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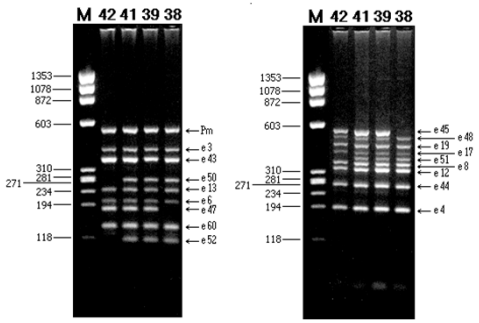
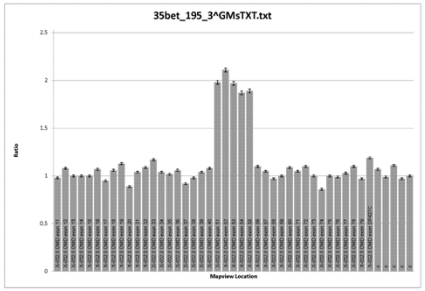
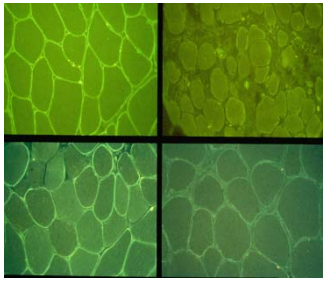
Molecular analyses of the dystrophin gene

- **Multiplex PCR reaction** (2x9 exons simultanously amplified in two reactions; Beggs and Chamberlain), since 2001.
- **Southern blot** using cDNA probes (XJ10,7b8,30.2, 30.1, 47.4, 60.1) since 2002.
- **MLPA:** Multiplex Ligation-dependent Probe Amplification (79 exons and promoter analysed; MRC Holland), since 2006.
- **Array CGH** by NMD-CHIP consortium 2008-2011.
- Immunohistochemistry and Western blot analysis of muscle biopsy (LMU Munich, H. Lochmüller, Molnar MJ, SE Clinic for Neurology)
- Sequencing of the dystrophin gene (Univ. Würzburg, Leiden, Ferrara)

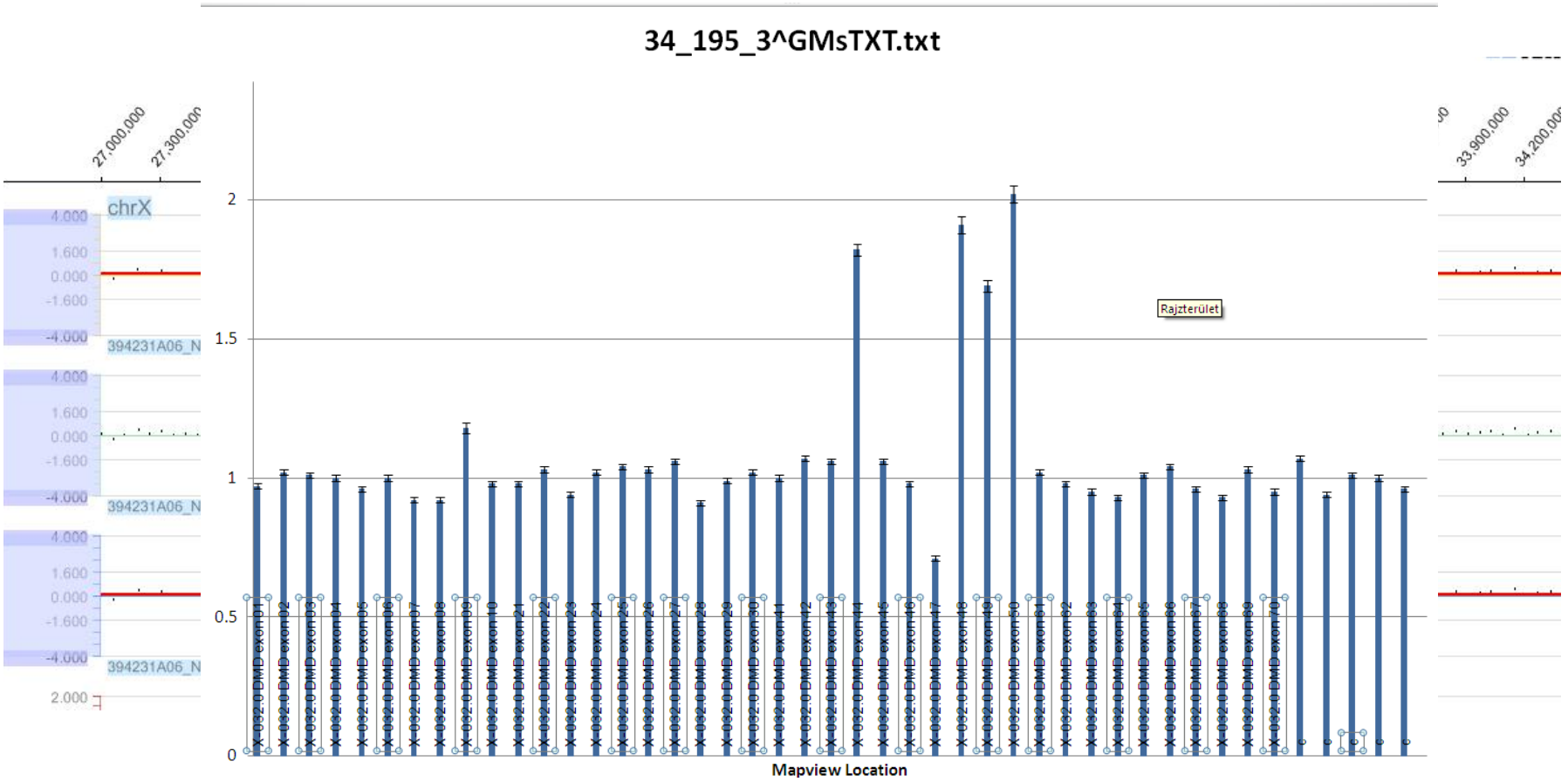






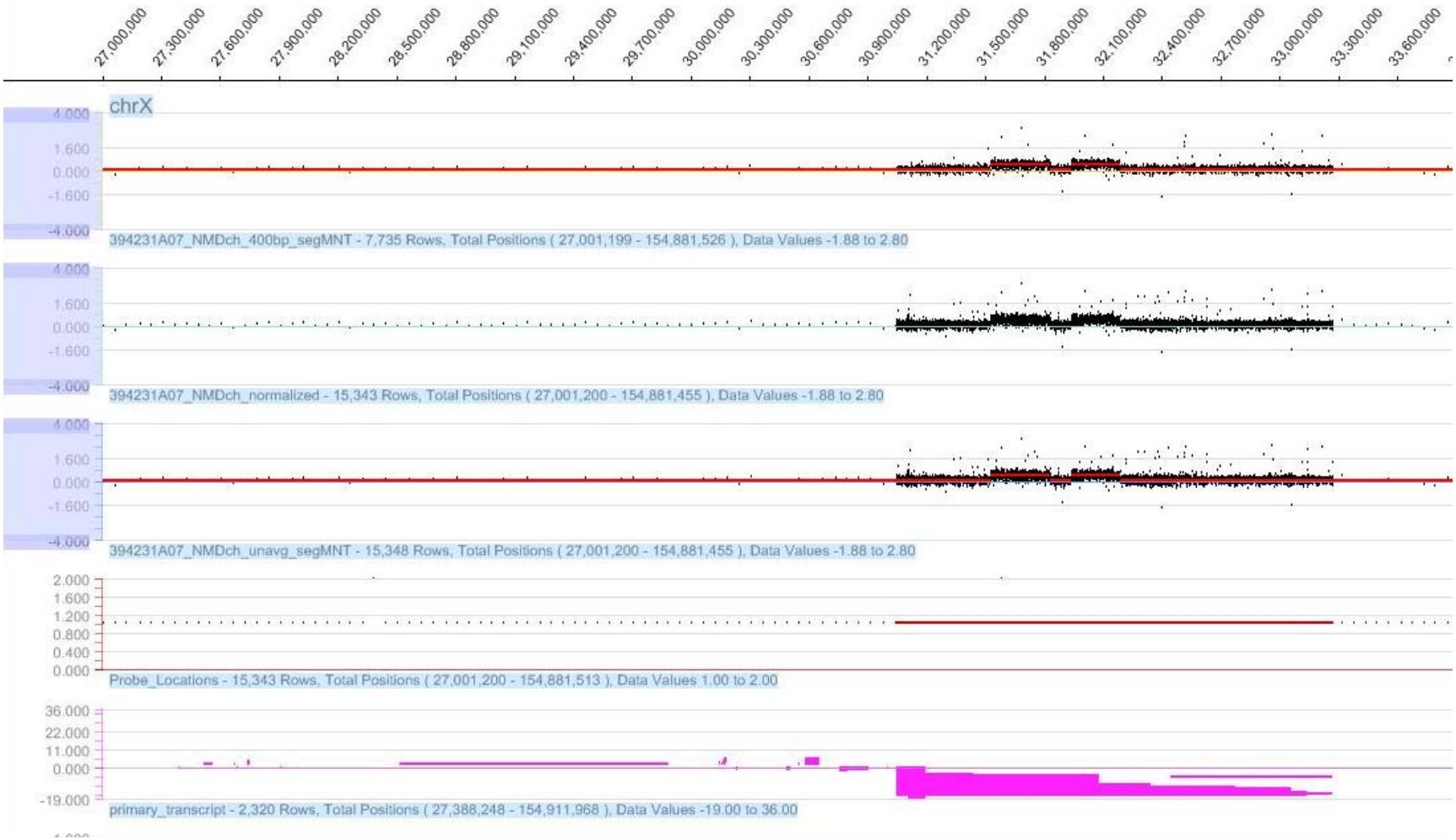
NMD-CHIP array analysis in the dystrophin gene

Sample 195/3 affected boy, duplication ex44 és ex48-ex55 (Score:+0,346)



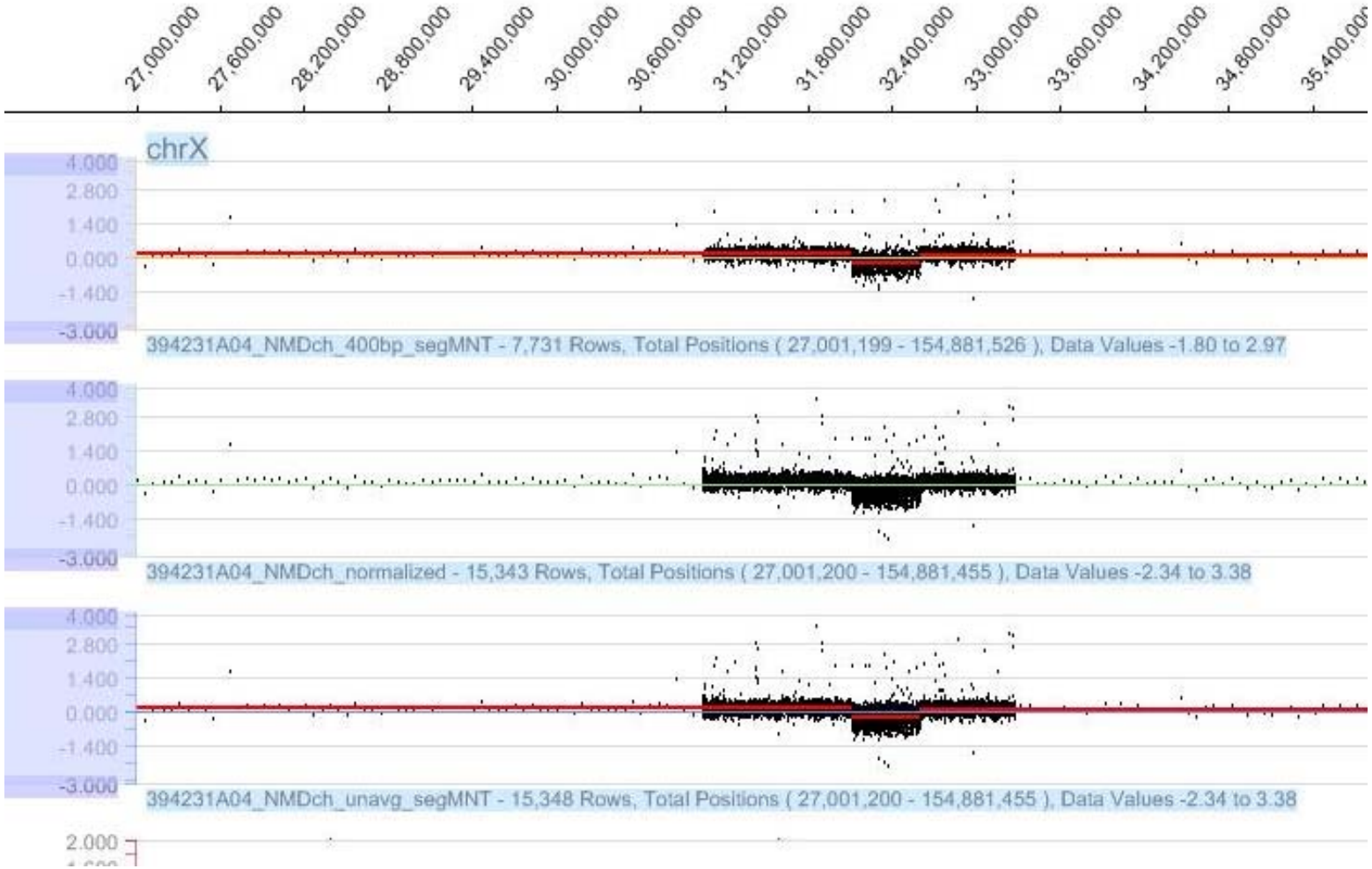
NMD-CHIP array analysis in the dystrophin gene

Sample 195/2 carrier mother, duplication ex44 és ex48-55 (Score:+0,315)

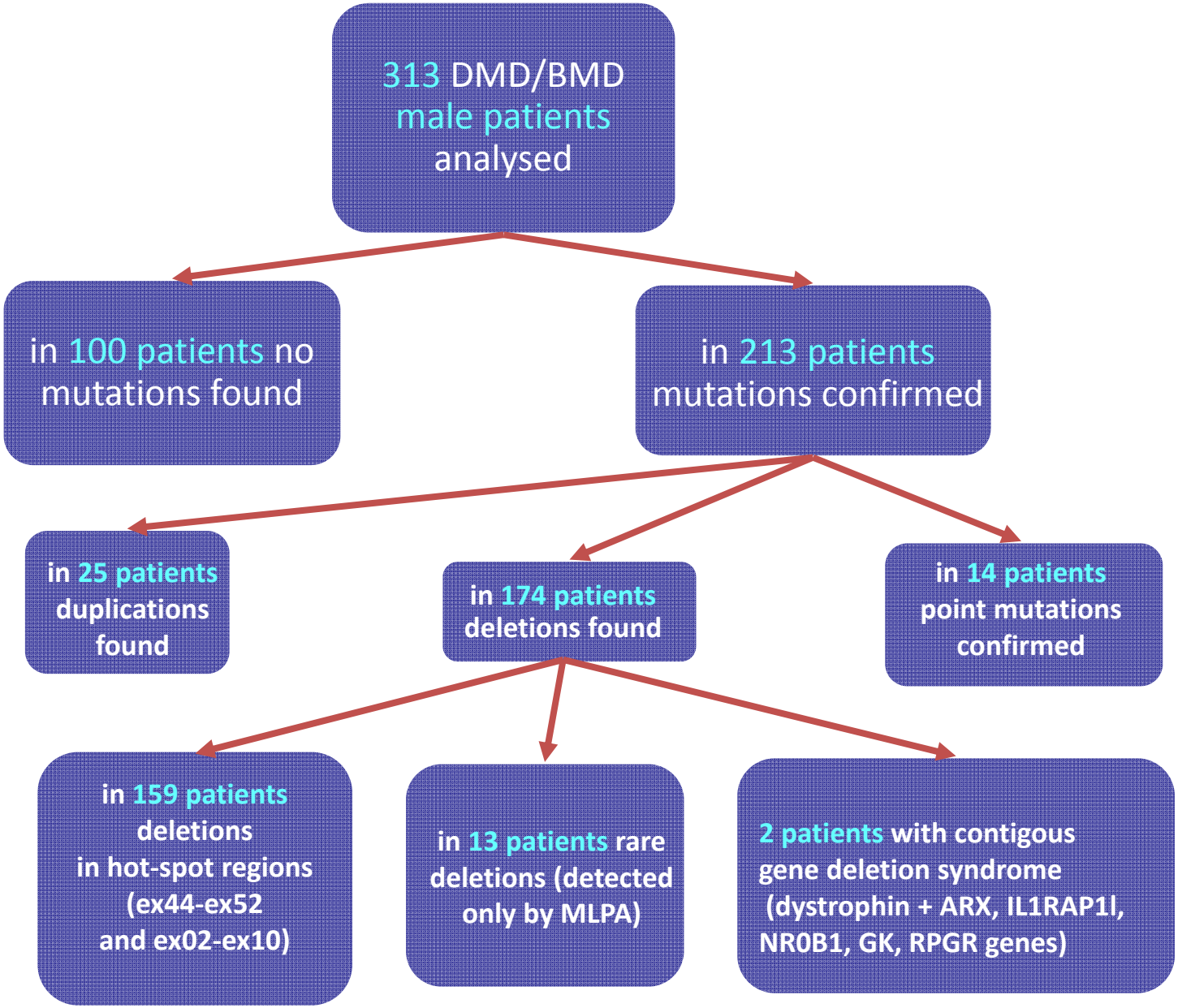


NMD-CHIP array analysis in the dystrophin gene

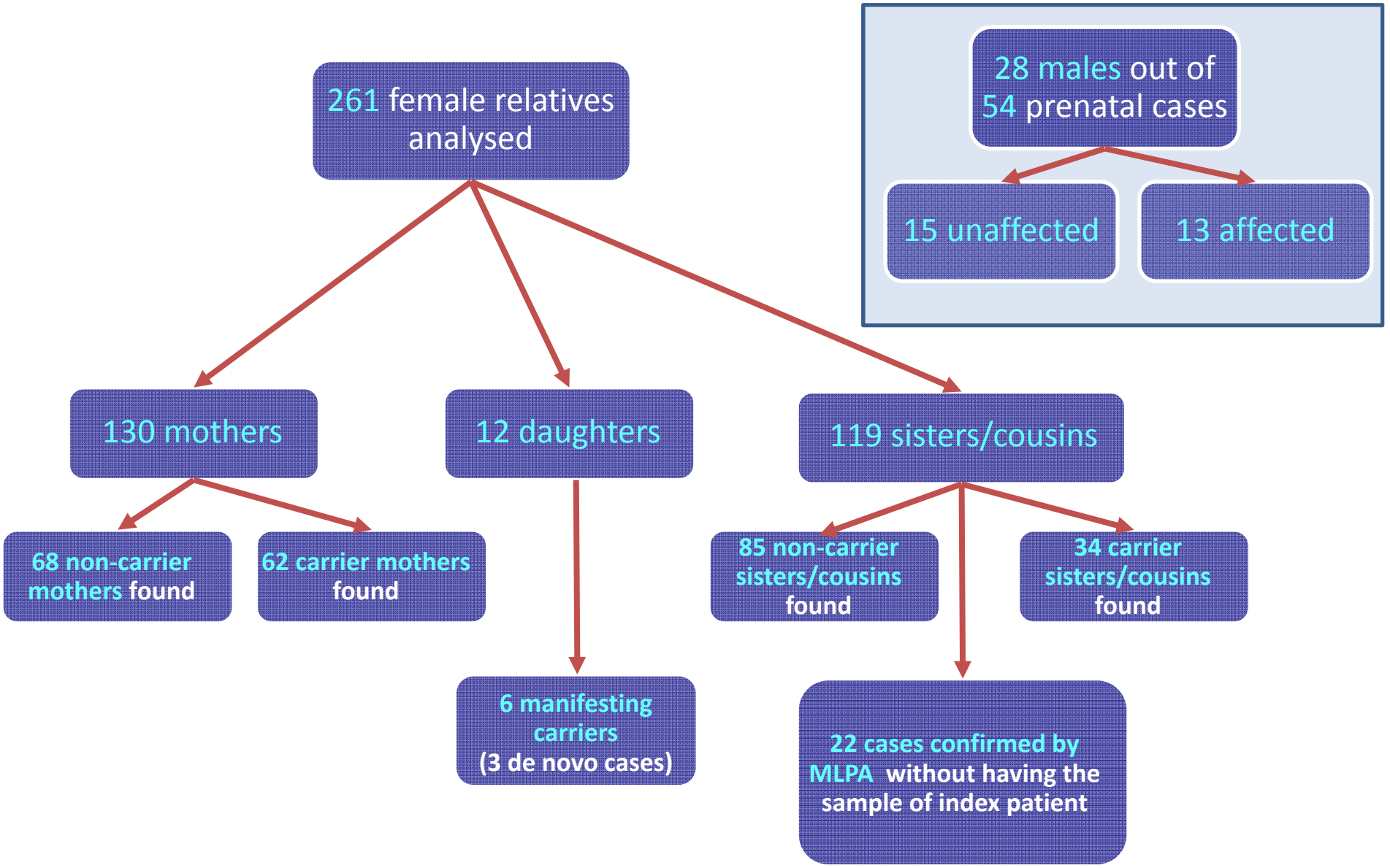
Sample 97/2 manifest carrier female, deletion in ex10-ex44 (Score:-0,385)



Results – male patients



Results – female relatives, prenatal diagnosis



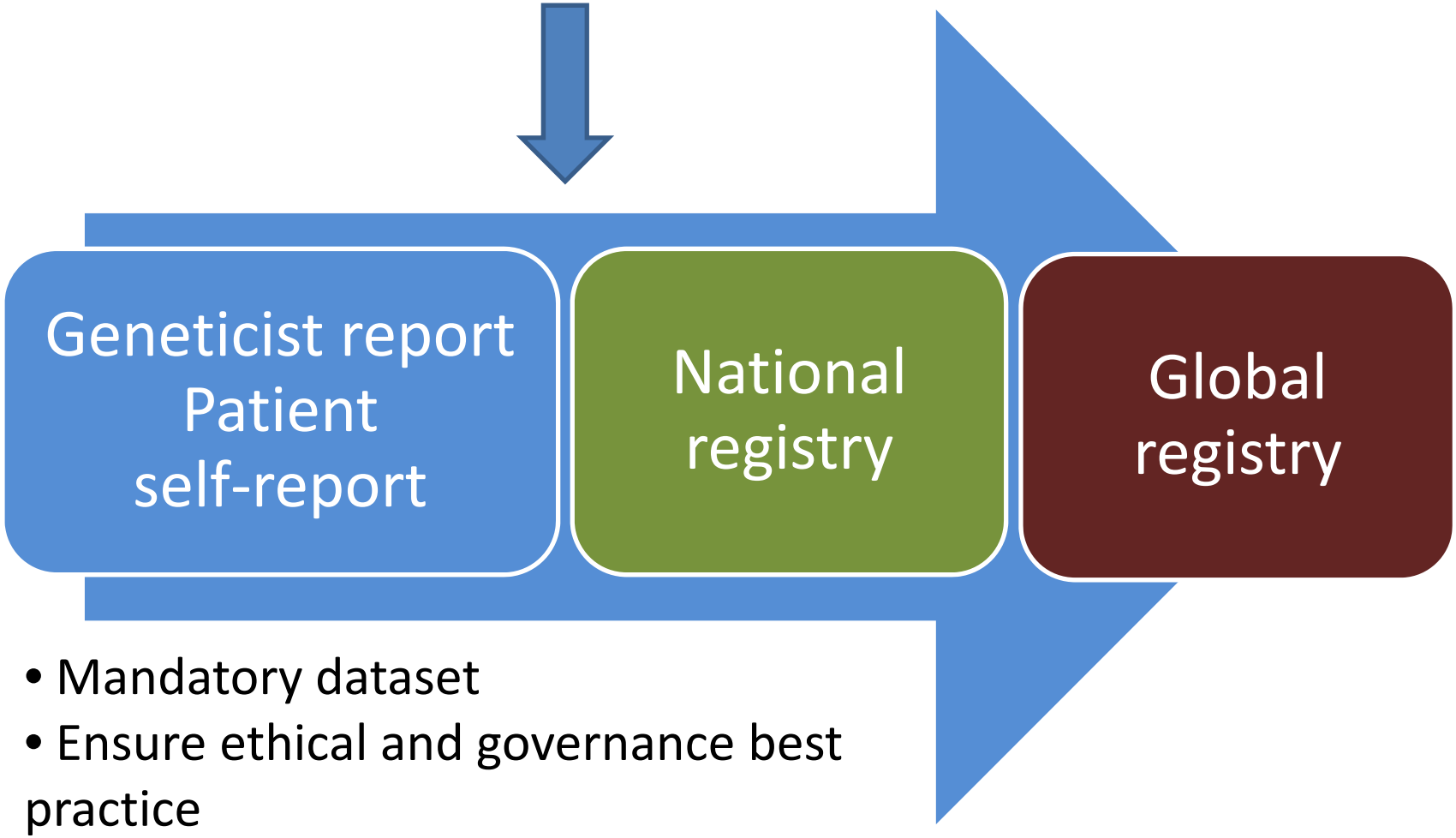
Duchenne Patient Registry

- Where are the patients?
- Are they properly diagnosed?
- Databases of patients with the genetic and clinical data
  - TREAT-NMD national and global registry
- Easy access to patient community,
- Necessary for clinical trial feasibility and recruitment,
- patient care,
- dissemination of information

Duchenne Patient Registry

Curation

Focus on reliable information



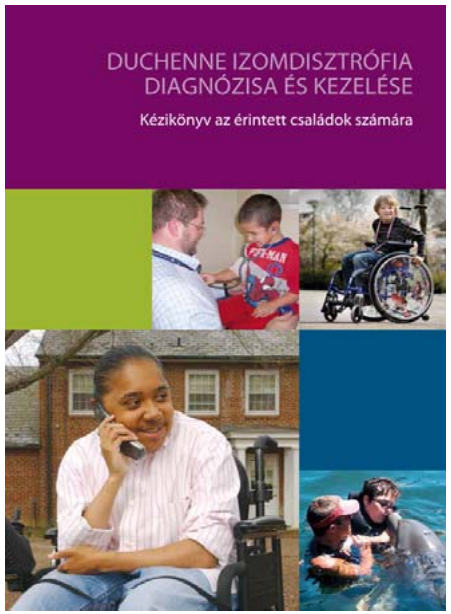
- Mandatory dataset
- Ensure ethical and governance best practice

Hungarian Duchenne Registry

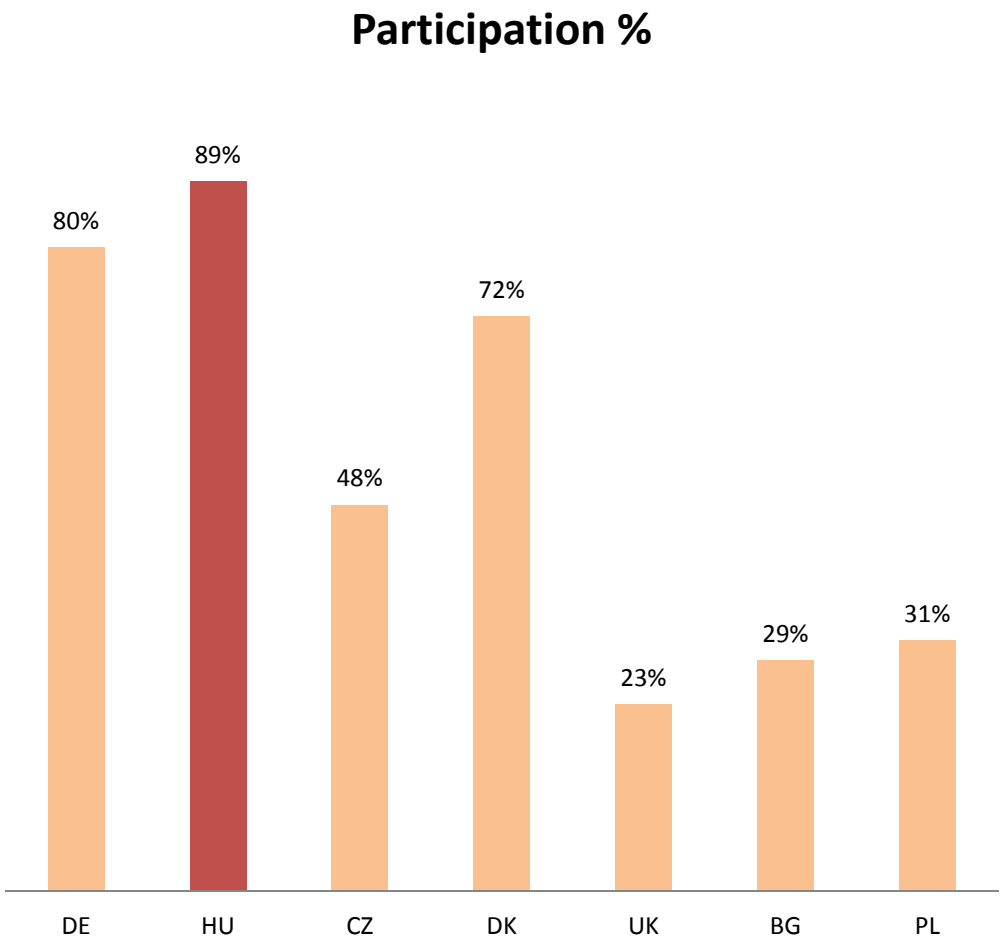
- 118 DMD patients
- Monitoring care practice, guidance
- Dissemination information
- Organizing group rehabilitation (same age, status)
- Availability for clinical trials
  - 2nd Pediatric Clinic of Semmelweis Univ. is registered as Care and Trial Site in the database of CTSR

Patient care practice survey

- **Part of the process of care recommendations**
  1. Consensus process
  2. Scientific publication
  3. Family guide
  4. Patient care practice survey
  5. Duchenne care centres
- **Part of surveying care practice in Duchenne Muscular Dystrophy in Europe**



Patient cohort



distributed n = 1677

completed n = 1071

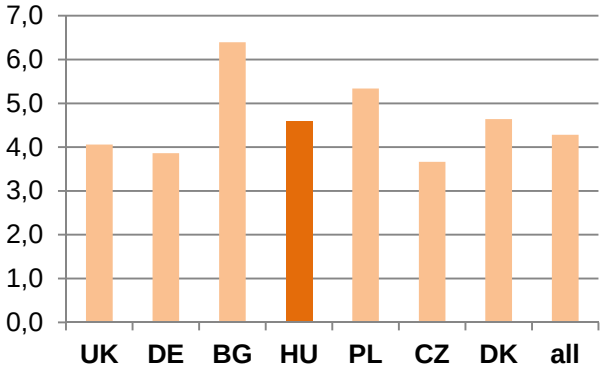
Hungarian patients n= 67

Hungarian evaluated n= 57

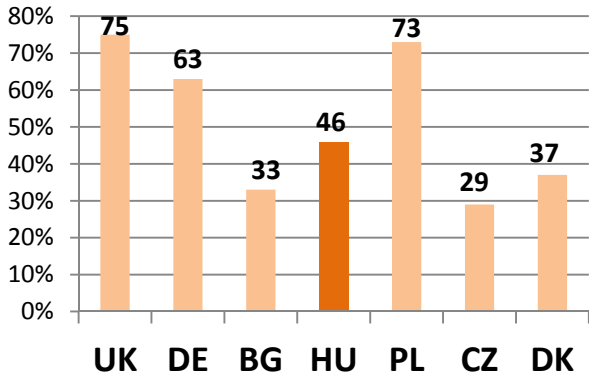
All selected from Duchenne patient registries

Some results of evaluation focusing on Hungary

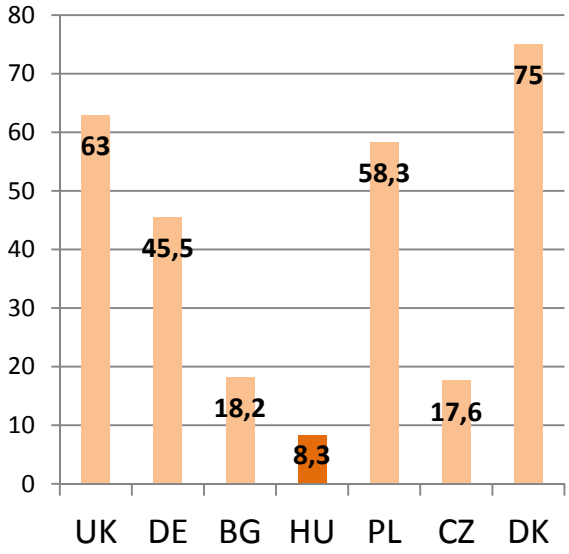
Age at diagnosis



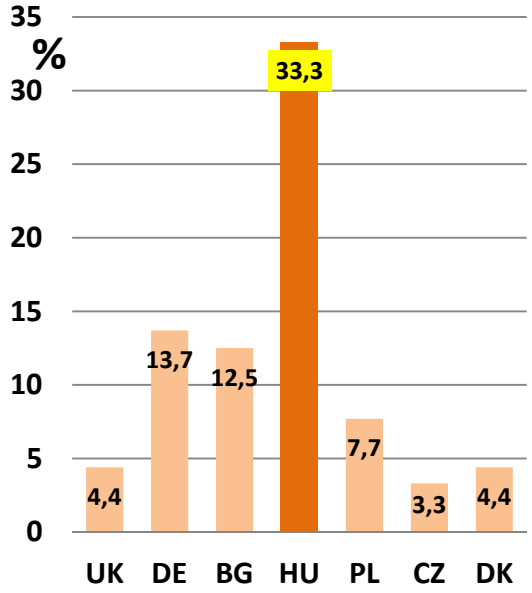
Steroid therapy %



Pulmonary assessment age ≥16



No information about home stretching



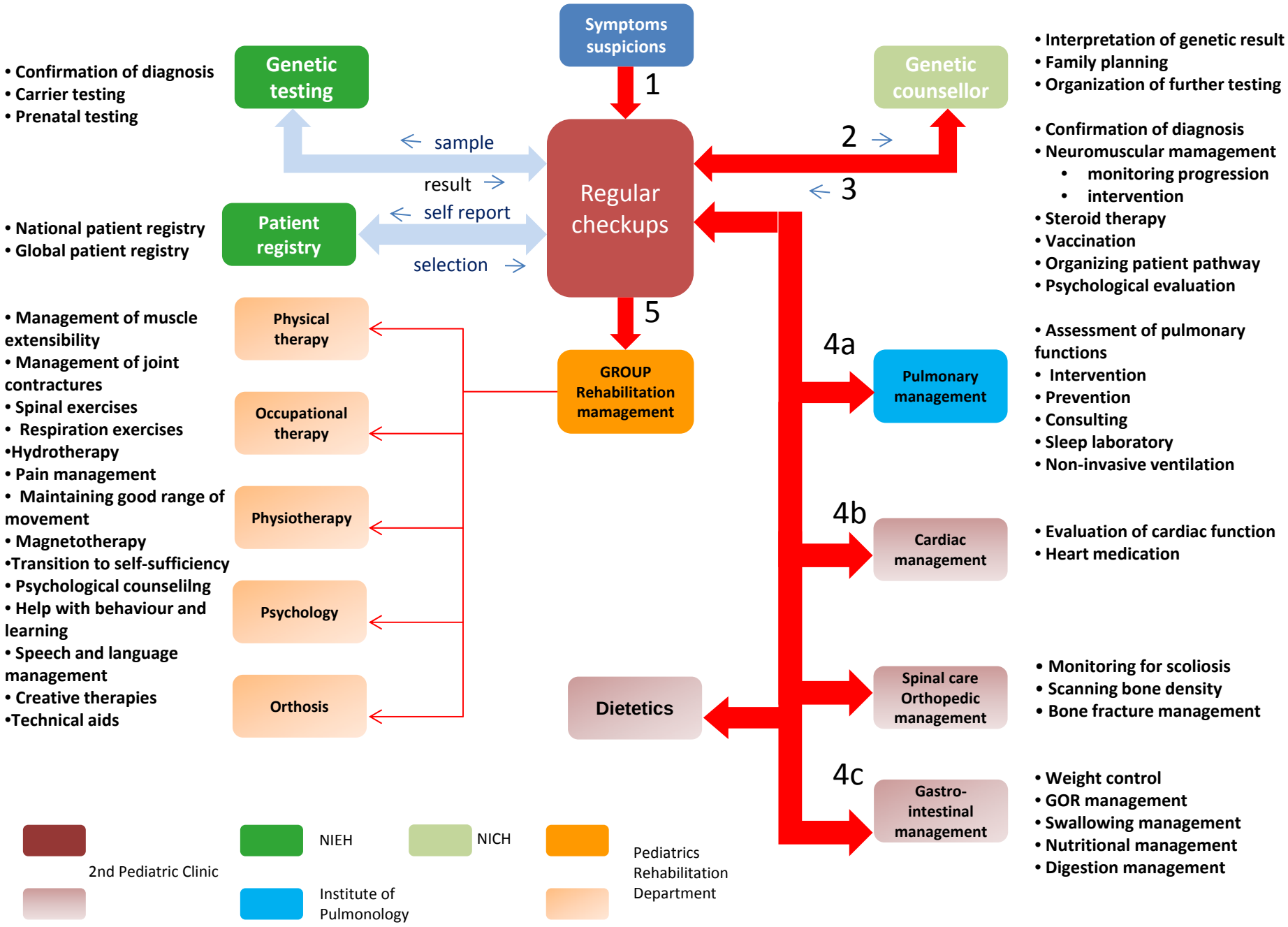
CARE-NMD

Budapest Neuromuscular Center

- **Budapest Neuromuscular Center was launched in 2012. The Center aims to treat Hungarian neuromuscular patients according to European and international best practices. It follows the international guidelines published in Lancet Neurology in 2010. Quality of life and life expectancy of DMD (and other NMD) young patients should be improved.**
- **The first Hungarian Neuromuscular Centre is lead by the 2nd Pediatric Clinic of Semmelweis Medical Unversity.**
- **The cooperating institutes are: National Institute of Environmental Health (genetic diganosis), National Institute of Child Health (genetic counselling), the Pediatric Rehabilitation Department of Szent János Hospital (rehabilitation), Pulmonology Institute in Törökbálint, Misko Foundation, Duchenne Foundation „Gyógyító Jószándék", Hungarian SMA Children's Foundation and RIROSZ.**

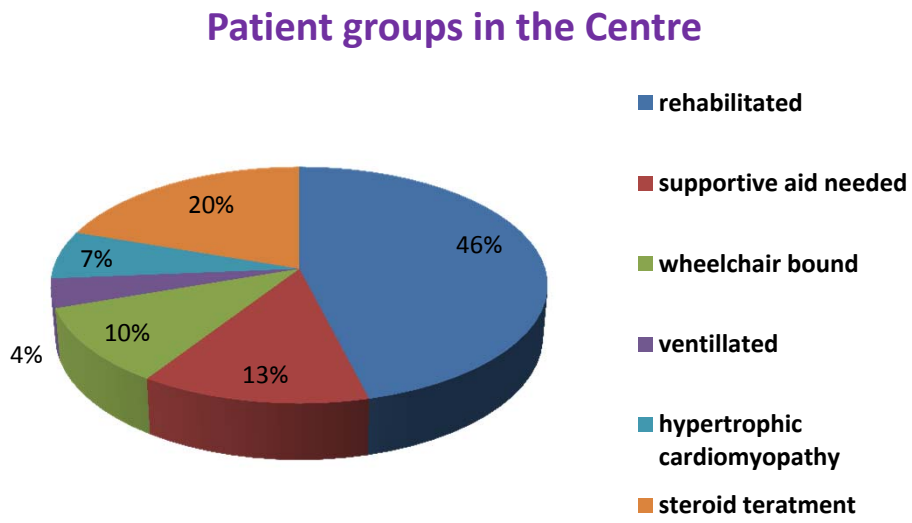
Izomcentrum+

Patient pathways



First year results

- More patients were involved in regular check-ups and rehabilitation than earlier
- More accurate examinations were done (ODM, pulmonary and cardiac function, etc.)
- Earlier diagnosis of involvement of other organ systems (lung, cardiac) - 3 patients are ventilated; HCM was diagnosed earlier
- Better understanding of effectiveness of steroids - more families agreed in steroid treatment
- Parents are educated for better care
- Improved support for families to help their children



There are still needs

- Governmental support and financial budget for this work
- Pulmonary monitoring and equipments for ventilation (CPAP, biPAP) lack financial support from health care
- Spinal surgery is only under development
- There are not enough well trained nurses and doctors
- More extensive dissemination of information for regional health services, doctors, nurses and families
- Support ends from EU - CARE-NMD consortium

CARE-NMD