

## Development of a standard of care for patients with valosin-containing protein (VCP) associated multisystem proteinopathy (MSP)

Manisha Korb<sup>1</sup>, Allison Peck<sup>4</sup>, Lindsay N Alfano<sup>5</sup>, Kenneth I Berger<sup>6</sup>, Meredith K. James<sup>7</sup>, Nupur Ghoshal<sup>8</sup>, Elise Healzer<sup>9</sup>, Claire Henchcliffe<sup>1</sup>, Shaida Khan<sup>10</sup>, Pradeep P A Mammen<sup>11</sup>, Sujata Patel<sup>12</sup>, Gerald Pfeffer<sup>13</sup>, Stuart H Ralston<sup>14</sup>, Bhaskar Roy<sup>15</sup>, Bill Seeley<sup>16</sup>, Andrea Swenson<sup>17</sup>, Tahseen Mozaffar<sup>1,3</sup>, Conrad Wehl<sup>18, 19</sup>, Virginia Kimonis<sup>2,3</sup>, on behalf of the VCP Standards of Care Working Group

Department of Neurology<sup>1</sup>, Pediatrics<sup>2</sup>, and Pathology & Laboratory Medicine<sup>3</sup>, University of California - Irvine School of Medicine, Orange CA, USA; Cure VCP Disease, Americas CA, USA<sup>4</sup>; The Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus OH, USA<sup>5</sup>; Department of Medicine (Pulmonary), NYU Grossman School of Medicine, New York NY, USA<sup>6</sup>; The John Walton Muscular Dystrophy Research Centre, Newcastle University and Newcastle Hospitals NHS Foundation Trust, Newcastle Upon Tyne, UK<sup>7</sup>; Department of Neurology and Psychiatry, Washington University in St. Louis, St. Louis MO, USA<sup>8</sup>; Thriving Hope Consulting, Vinton Iowa, USA<sup>9</sup>; Department of Neurology & Neurotherapeutics<sup>10</sup> and Medicine (Cardiology)<sup>11</sup>; University of Texas Southwestern Medical Center, Dallas TX, USA; Wellness with Sujata, Wadsworth, Ohio<sup>12</sup>; Hotchkiss Brain Institute, University of Calgary Cumming School of Medicine, Calgary AB, Canada<sup>13</sup>; Institute of Genetics and Cancer at the University of Edinburgh, Edinburgh SCT, UK<sup>14</sup>; Department of Neurology, Yale School of Medicine, New Haven CT, USA<sup>15</sup>; Well Institute for Neurosciences University of California San Francisco, San Francisco CA, USA<sup>16</sup>; Department of Neurology, University of Iowa Hospitals and Clinics, Iowa City IA, USA, and Department of Neurology<sup>18</sup> and The Hope Center<sup>19</sup>, Washington University in St. Louis, St. Louis MO, USA.



✉ [allison@curevcp.org](mailto:allison@curevcp.org)  
 🌐 [www.curevcp.org](http://www.curevcp.org)  
 📧 @Allison38600974  
 📄 allison-peck-vcp

**AIM 1:** Establishing a multidisciplinary standard of care for appropriate pharmacotherapies and supportive therapies

**AIM 2:** Expediting time to accurate diagnosis

**AIM 3:** Identify gaps and future directions for clinical research

### METHODS

1. Recruited a multidisciplinary team of 50 physicians and therapists
2. Domain teams reviewed literature, exchanged ideas, and prepared a domain consensus recommendation based on expert opinion and adjacent disease practices
3. A virtual consortium meeting was held on April 9, 2021
4. Meeting discussion points integrating into one manuscript with team member sign-off

### PATIENT ADVOCACY ROLE

1. Provided patient perspective in project scope
2. Recruited expert clinicians to participate
3. Organized communications, facilitated discussions, and hosted meetings
4. Assisted in literature review
5. Reviewed and edited the manuscript concerning patient perspective and symptoms

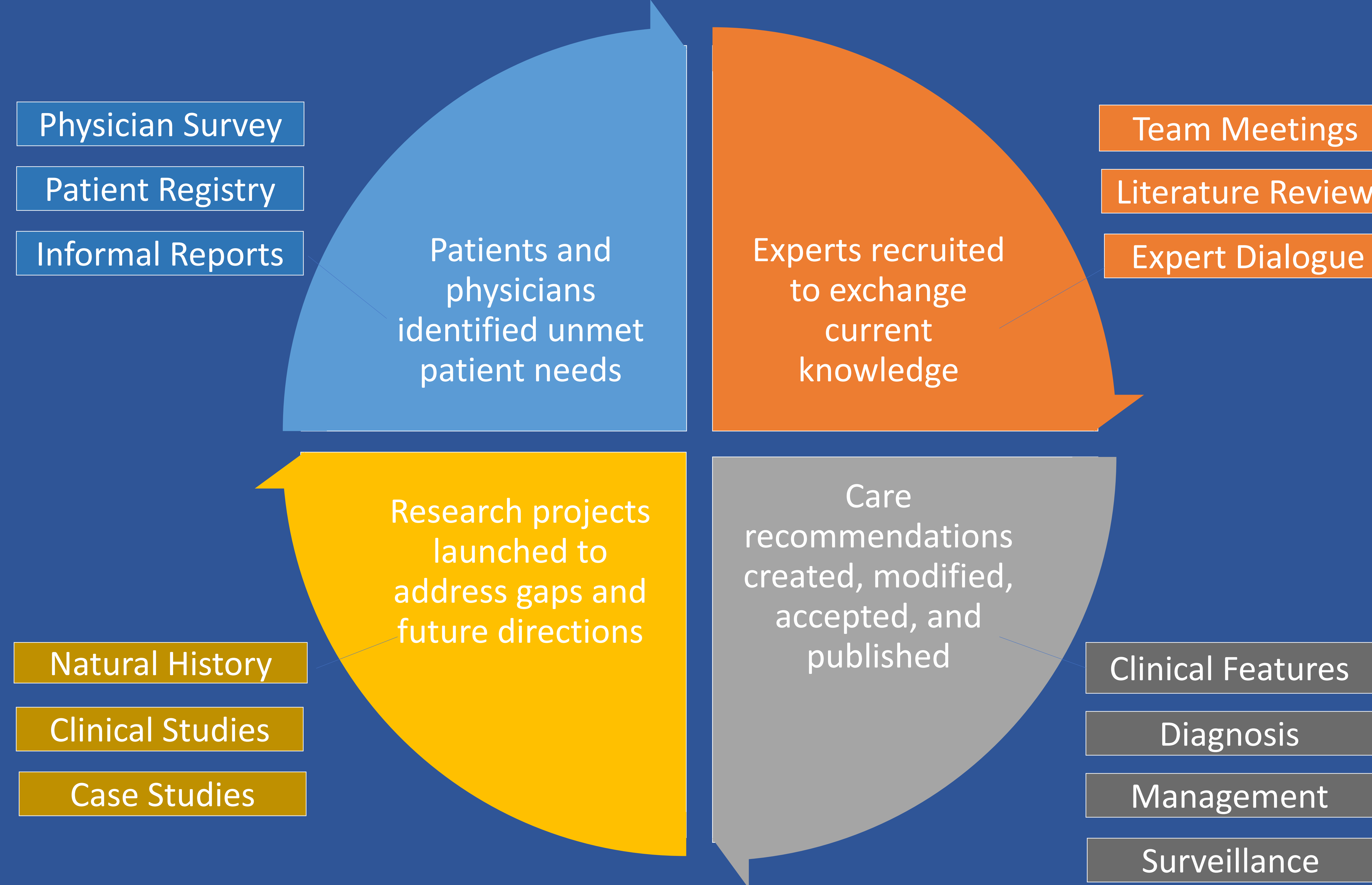
### RESULTS

- Each domain team created a 2-5 page consensus guideline
- One multidisciplinary manuscript has been submitted for publication

# International collaboration among a multidisciplinary team addresses unmet patient need in rare disease:

1. Delays in diagnosis and prolonged time to treatment
2. Delays in recognizing involvement of other organ systems
3. Disparate care between clinics
4. Disease development in at risk, undiagnosed family members

## OUR STANDARD OF CARE DEVELOPMENT CYCLE



### REFERENCES:

1. Korb MK, Kimonis VE, Mozaffar T. Multisystem proteinopathy: Where myopathy and motor neuron disease converge. *Muscle Nerve* 2021;63:442-454.
2. Al-Obeidi E, Al-Tahan S, Surampalli A, et al. Genotype-phenotype study in patients with valosin-containing protein mutations associated with multisystem proteinopathy. *Clin Genet* 2018;93:119-125.
3. Evangelista T, Wehl CC, Kimonis V, Lochmuller H, Consortium VCPrd. 215th ENMC International Workshop VCP-related multi-system proteinopathy (IBMPFD) 13-15 November 2015, Heemskerk, The Netherlands. *Neuromuscul Disord* 2016;26:535-547.
4. Taylor JP. Multisystem proteinopathy: intersecting genetics in muscle, bone, and brain degeneration. *Neurology* 2015;85:658-660.
5. Mehta SG, Khare M, Ramani R, et al. Genotype-phenotype studies of VCP-associated inclusion body myopathy with Paget disease of bone and/or frontotemporal dementia. *Clin Genet* 2013;83:422-431.
6. Ralston SH, Corral-Gudino L, Cooper C, et al. Diagnosis and Management of Paget's Disease of Bone in Adults: A Clinical Guideline. *J Bone Miner Res* 2019;34:579-604.

### ABOUT VCP ASSOCIATED MSP

Rare, heterogeneous, autosomal dominant, genetic disorder affecting multiple organ systems including the muscular, skeletal, and central nervous system

### PREVALENCE OF PHENOTYPES

- Inclusion Body Myopathy ~ 90%
- Paget's disease of Bone ~ 40%
- Frontotemporal dementia ~ 30%
- Respiratory dysfunction ~ 40-50%
- Amyotrophic lateral sclerosis ~10%
- Parkinson disease ~ 4%
- Alzheimer disease ~ 2%
- Spastic paraplegia ~ isolated
- Charcot Marie Tooth disease ~ isolated
- Cardiomyopathy ~ unknown
- Urinary and anal dysfunction ~ unknown

### MULTIDISCIPLINARY DOMAIN TEAMS

- Genetic diagnosis
- Myopathy
- Frontotemporal dementia
- Paget's disease of bone
- ALS and CMT
- Parkinson's disease/ parkinsonism
- Cardiomyopathy
- Respiratory dysfunction
- Supportive therapies [including physical and occupational therapy, speech language pathology]
- Mental health
- Supplements and nutrition

