Appendix e-1
Checklists for collection of relevant clinical data

For internal use only:
Toronto ID number: _____ Form received by: _____ Date received: _____

Project overview:

An increasing number of reports suggest that individuals with a 22q11.2 deletion have a significantly increased risk for developing early-onset Parkinson's disease (PD). However, it is yet unknown ***when*** (age at onset) and ***how*** (presenting characteristics) PD in 22q11.2 deletion syndrome (22q11.2DS) may manifest. Similarly, ***disease progression*** has not yet been systematically evaluated.

The aim of this study is to compile a case series of individuals with ***both* 22q11.2DS** and **PD** accompanied by detailed clinical data. We are also interested to hear about individuals who are exhibiting parkinsonian symptoms possibly indicative of PD but have not received a definitive PD diagnosis. All data will be anonymized and published in aggregate. The results of this study will be important for informing genetic counselling and anticipatory care.

If you have a case with 22q11.2DS and (possible) PD we are inviting you to please fill in the details of this clinical checklist and return it to erik.boot@uhn.ca or butchern@email.chop.edu by April 22, 2016. Participating clinicians/researchers will be acknowledged as a co-author on publications. Please feel free to forward this form to any colleague who may have a patient that fit these criteria.

Name and title of person completing form: _____

Medical/research specialty: _____

Name of principal investigator/clinician (if different from above): _____

Email address and phone number: _____

Mailing address: _____

A) Patient demographic information

Local patient ID number: _____

Sex:
☐ M
☐ F

Age (years) at most recent assessment: _____

If deceased, age (years) at death: _____

Ethnicity: _____

Ascertainment: _____

Medications *at most recent assessment* (or at death):
Medication name: Daily dose:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Supplements (e.g. vitamin D) *at most recent assessment* (or at death):

Supplement name:	Daily dose:
_____	_____
_____	_____
_____	_____

B) Genetics and 22q11.2DS-associated health issues

Age (years) at the time of molecular confirmation of 22q11.2 deletion: _____

Genetic test that confirmed a 22q11.2 deletion:

☐ FISH
☐ MLPA
☐ Microarray (e.g., SNP array or CGH array)

Is the 22q11.2 deletion inherited?

☐ Yes
  ☐ From mother
  ☐ From father
☐ No (*de novo*)
☐ Unsure/unknown
  ☐ *Not* from mother (negative genetic test)
  ☐ *Not* from father (negative genetic test)

Has this patient been diagnosed with another clinically relevant genetic disorder (e.g. an additional pathogenic deletion or duplication)?

☐ Yes (please specify): _____
☐ No/unknown

Has any testing performed for known PD genes (e.g. *LRRK2*)?

☐ Yes (please specify genes, findings, and method): _____
☐ No/unknown

Have samples been biobanked for molecular studies?

☐ Yes (please specify sample type, e.g., DNA, cell lines): _____
☐ No, but could obtain
☐ No

Clinical features of the 22q11.2 deletion *(please check all that apply)***:**

☐ Developmental/intellectual disability
- ☐ Mild
- ☐ Moderate
- ☐ Severe/profound

☐ IQ: _____, at age _____ (if known) using _____ test (if known)
(Please provide highest reported full scale IQ in case of multiple assessments)

☐ Congenital heart defect (please specify): _____

☐ Palatal abnormalities or speech problem such as hypernasality:
- ☐ Overt cleft palate
- ☐ Submucous cleft palate
- ☐ Velopharyngeal insufficiency
- ☐ Hypernasal speech

☐ Other congenital malformation(s) (please specify): _____

☐ Endocrine related diseases
- ☐ Hypocalcemia
- ☐ Hypothyroidism
- ☐ Other (please specify): _____

☐ Seizures/epilepsy (please specify): _____

☐ Sleep apnea/other sleep disorder (please specify): _____

☐ Psychiatric disorders & age at onset: *please specify in table below*

☐ Other (please specify): _____
_____

Has this patient been previously reported in the literature?
With respect to Parkinson's disease ☐ Yes ☐ No

If yes, please provide the manuscript citation(s): _____

C) Parkinson's disease (PD) expression

☐ PD diagnosis ***confirmed*** by neurologist
Age (years) _____ at diagnosis
Age (years) _____ motor symptoms onset (estimate)

Please indicate if the neurologist was a ***movement disorders specialist*** ☐ Yes ☐ No

☐ PD diagnosis ***suspected*** but not (yet) confirmed by a neurologist*
Current Age (years) _____
Age (years) _____ motor symptoms onset (estimate)

We are also interested to hear about individuals who are noted as exhibiting parkinsonian symptoms possibly indicative of PD but have not received a definitive PD diagnosis. (For example, if a patient exhibits parkinsonism, but is receiving a low potency antipsychotic medication). We will define **PD as present when at least bradykinesia and one of rest tremor or rigidity are present. Do not hesitate to contact us with any questions that you may have in this regard.*

Family history of neurodegenerative and/or movement disorder(s):

☐ Not aware of a neurodegenerative and/or movement disorder in any first-degree relative

☐ Yes (please specify):
- ☐ Relation: _____

- ☐ Disease: _____
- ☐ Age (years) at onset (estimate): _____

- ☐ Relation: _____
- ☐ Disease: _____
- ☐ Age (years) at onset (estimate): _____

- ☐ Relation: _____
- ☐ Disease: _____
- ☐ Age (years) at onset (estimate): _____

☐ Unknown

Results of dopaminergic imaging *(e.g. with DaT-SPECT)***:**

☐ Not applicable

Age (years) at dopaminergic imaging _____

☐ Type of scanner
- ☐ PET
- ☐ SPECT

☐ Ligand: _____

☐ Findings (*please be as specific as possible*):

_____
_____
_____

Response to levodopa

☐ Clear and obvious good response
☐ Partial but definite response
☐ Questionable or no response
☐ Untreated

Response to other antiparkinsonian drugs (anticholinergics, amantadine, dopamine agonists):

Medication name: _____

☐ Clear and obvious good response
☐ Partial but definite response
☐ Questionable or no response

Response to other antiparkinsonian drugs:

Medication name: _____

☐ Clear and obvious good response
☐ Partial but definite response
☐ Questionable or no response

Medication *at PD diagnosis*:

Medication name:	Daily dose:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Highest dose of antiparkinsonian medication that has been used:

Medication name:	Daily dose:	Age (years) at start:	Duration of treatment (months):
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Supplements (e.g., vitamin D) *at PD diagnosis*:

Supplement name:	Daily dose:
_____	_____
_____	_____
_____	_____

In case of death and neuropathological examination, please provide details on cause of death and PD-related findings:

_____
_____
_____

In case of death and neuropathological examination, please specify if there is frozen or fixed brain tissue available for study and the regions available:

_____
_____

Other comments:

We are very interested in your opinions about 22q11.2DS-PD (thoughts, observations, brain bank etc.)

_____
_____
_____
_____
_____
_____
_____

PLEASE COMPLETE THE ENCLOSED TABLE

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Motor symptoms	Age at initial presentation	Comments
Tremor		
O Rest O Posture O Action / Body part _____	LEFT ___ year; RIGHT ___ year	_____
O Rest O Posture O Action / Body part _____	LEFT ___ year; RIGHT ___ year	_____
O Rest O Posture O Action / Body part _____	LEFT ___ year; RIGHT ___ year	_____
Bradykinesia		
Reduced degree of facial expression	___ year	_____
Reduced voice volume and/or modulation	___ year	_____
Global slowness and poverty of movement	___ year	_____
Reduced arm swing	LEFT ___ year; RIGHT ___ year	_____
Bradykinesia of the hands and/or fingers	LEFT ___ year; RIGHT ___ year	_____
Bradykinesia of the legs and/or toes	LEFT ___ year; RIGHT ___ year	_____
Muscle rigidity/stiffness		
Body part _____	LEFT ___ year; RIGHT ___ year	_____
Body part _____	LEFT ___ year; RIGHT ___ year	_____
Body part _____	LEFT ___ year; RIGHT ___ year	_____
Postural instability	___ year	_____
Gait changes/disorder	___ year	_____
O Falls O Assistance needed with ambulation	___ year / ___ year	_____
Change in writing/loss of dexterity	LEFT ___ year; RIGHT ___ year	_____
Swallowing disturbances		
O Worsened from baseline O With functional impairment	___ year	_____
Dystonia		
O Focal O Multifocal O Generalized O Hemi O Segmental	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs
O Focal O Multifocal O Generalized O Hemi O Segmental	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs

O Focal O Multifocal O Generalized O Hemi O Segmental	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs

Dyskinesia

O Focal O Generalized O Hemibody	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs
O Focal O Generalized O Hemibody	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs
O Focal O Generalized O Hemibody	LEFT ___ year; RIGHT ___ year	Body part _____ O Induced by antiparkinsonian drugs

Highest score on the Unified Parkinson's Disease Rating Scale (UPDRS) part III (motor scale): _____ Assessed with O UPDRS O MDS-UPDRS

Non-motor symptoms	**Age at initial presentation**	**Comments**
Cognitive decline	Decline first noted at age: ___ year	_____
Premorbid IQ	IQ: ___, age at assessment: ___ year	_____
IQ at last assessment	IQ: ___, age at assessment: ___ year	_____
Autonomic disorders		
Constipation	___ year	_____
Urinary incontinence	___ year	_____
History of psychiatric disorders/symptoms		
Schizophrenia spectrum and other psychotic disorders		
Schizophrenia	___ year	_____
Schizoaffective disorder	___ year	_____
Delusional disorder	___ year	_____
Brief psychotic disorder	___ year	_____
Anxiety disorders		
Generalized anxiety disorder	___ year	_____
Panic disorder	___ year	_____

Social anxiety disorder	___ year	_____
Specific phobia	___ year	_____
Separation anxiety disorder	___ year	_____
Mood/bipolar disorders		
Major depressive disorder	___ year	_____
Bipolar disorder	___ year	_____
Obsessive compulsive- and related disorders		
Obsessive-compulsive disorder	___ year	_____
Excoriation (skin-picking) disorder	___ year	_____
Attention deficit/hyperactive disorder	___ year	_____
Autism spectrum disorder	___ year	_____
Other: _____	___ year	_____
		_____

Appendix e-2

RESULTS OF LITERATURE SEARCH

** Publications reporting on individual(s) with coexistent 22q11.2DS and PD*
† duplicate records; identified through both PubMed and Web of Science searching

A. PubMed search (n = 22; performed November 1, 2016)

1*: Foo JN, Lee J, Tan LC, Liu J, Tan EK. **Large 3-Mb deletions at 22q11.2 locus in Parkinson's disease and schizophrenia**. Mov Disord. 2016 Dec;31(12):1924-1925.

2: Bassett AS, Costain G, Marshall CR. **Neuropsychiatric aspects of 22q11.2 deletion syndrome: considerations in the prenatal setting**. Prenat Diagn. 2017 Jan;37(1):61-69.

3†: Tan EK. **Chromosomal deletion at 22q11.2 and Parkinson's disease**. Lancet Neurol. 2016 May;15(6):538-40.

4*†: Mok KY, Sheerin U, Simón-Sánchez J, Salaka A, Chester L, Escott-Price V, Mantripragada K, Doherty KM, Noyce AJ, Mencacci NE, Lubbe SJ; International Parkinson's Disease Genomics Consortium (IPDGC), Williams-Gray CH, Barker RA, van Dijk KD, Berendse HW, Heutink P, Corvol JC, Cormier F, Lesage S, Brice A, Brockmann K, Schulte C, Gasser T, Foltynie T, Limousin P, Morrison KE, Clarke CE, Sawcer S, Warner TT, Lees AJ, Morris HR, Nalls MA, Singleton AB, Hardy J, Abramov AY, Plagnol V, Williams NM, Wood NW. **Deletions at 22q11.2 in idiopathic Parkinson's disease: a combined analysis of genome-wide association data**. Lancet Neurol. 2016 May;15(6):585-96.

5*: Pollard R, Hannan M, Tanabe J, Berman BD. **Early-onset Parkinson disease leading to diagnosis of 22q11.2 deletion syndrome**. Parkinsonism Relat Disord. 2016 Apr;25:110-1.

6*†: Oki M, Hori S, Asayama S, Wate R, Kaneko S, Kusaka H. **Early-onset Parkinson's disease associated with chromosome 22q11.2 deletion syndrome**. Intern Med. 2016 Feb;55(3):303-5.

7*†: Rehman AF, Dhamija R, Williams ES, Barrett MJ. **22q11.2 deletion syndrome presenting with early-onset Parkinson's disease**. Mov Disord. 2015 Aug;30(9):1289-90.

8†: Boot E, Butcher NJ, Vorstman JA, van Amelsvoort TA, Fung WL, Bassett AS. **Pharmacological treatment of 22q11.2 deletion syndrome-related psychoses**. Pharmacopsychiatry. 2015 Sep;48(6):219-20.

9†: Butcher NJ, Fung WL, Fitzpatrick L, Guna A, Andrade DM, Lang AE, Chow EW, Bassett AS. **Response to clozapine in a clinically identifiable subtype of schizophrenia**. Br J Psychiatry. 2015 Jun;206(6):484-91.

10*†: Boot E, Butcher NJ, van Amelsvoort TA, Lang AE, Marras C, Pondal M, Andrade DM, Fung WL, Bassett AS. **Movement disorders and other motor abnormalities in adults with 22q11.2 deletion syndrome**. Am J Med Genet A. 2015 Mar;167A(3):639-45.

11: Fung WL, Butcher NJ, Costain G, Andrade DM, Boot E, Chow EW, Chung B, Cytrynbaum C, Faghfoury H, Fishman L, García-Miñaúr S, George S, Lang AE, Repetto G, Shugar A, Silversides C, Swillen A, van Amelsvoort T, McDonald-McGinn DM, Bassett AS. **Practical guidelines for managing adults with 22q11.2 deletion syndrome**. Genet Med. 2015 Aug;17(8):599-609.

12†: Ogaki K, Ross OA. **Chromosome 22q11.2 deletion may contain a locus for recessive early-onset Parkinson's disease**. Parkinsonism Relat Disord. 2014 Sep;20(9):945-6.

13*†: Butcher NJ, Kiehl TR, Hazrati LN, Chow EW, Rogaeva E, Lang AE, Bassett AS. **Association between early-onset Parkinson disease and 22q11.2 deletion syndrome: identification of a novel genetic form of Parkinson disease and its clinical implications**. JAMA Neurol. 2013 Nov;70(11):1359-66.

14: Shulman JM. **Structural variation and the expanding genomic architecture of Parkinson disease**. JAMA Neurol. 2013 Nov;70(11):1355-6.

15†: Jonas RK, Montojo CA, Bearden CE. **The 22q11.2 deletion syndrome as a window into complex neuropsychiatric disorders over the lifespan**. Biol Psychiatry. 2014 Mar 1;75(5):351-60.

16†: Liu X, Dobbie M, Tunningley R, Whittle B, Zhang Y, Ittner LM, Götz J. **ENU mutagenesis screen to establish motor phenotypes in wild-type mice and modifiers of a pre-existing motor phenotype in tau mutant mice**. J Biomed Biotechnol. 2011 Dec:130947.

17*: Booij J, van Amelsvoort T, Boot E. **Co-occurrence of early-onset Parkinson disease and 22q11.2 deletion syndrome: Potential role for dopamine transporter imaging**. Am J Med Genet A. 2010 Nov;152A(11):2937-8.

18*: Zaleski C, Bassett AS, Tam K, Shugar AL, Chow EW, McPherson E. **The co-occurrence of early onset Parkinson disease and 22q11.2 deletion syndrome**. Am J Med Genet A. 2009 Mar;149A(3):525-8.

19: Long JM, LaPorte P, Merscher S, Funke B, Saint-Jore B, Puech A, Kucherlapati R, Morrow BE, Skoultchi AI, Wynshaw-Boris A. **Behavior of mice with mutations in the conserved region deleted in velocardiofacial/DiGeorge syndrome**. Neurogenetics. 2006 Nov;7(4):247-57.

20: Bhattacharya N. **Fetal cell/tissue therapy in adult disease: a new horizon in regenerative medicine**. Clin Exp Obstet Gynecol. 2004;31(3):167-73.

21†: Peng XR, Jia Z, Zhang Y, Ware J, Trimble WS. **The septin CDCrel-1 is dispensable for normal development and neurotransmitter release**. Mol Cell Biol. 2002 Jan;22(1):378-87.

22*†: Krahn LE, Maraganore DM, Michels VV. **Childhood-onset schizophrenia associated with parkinsonism in a patient with a microdeletion of chromosome 22**. Mayo Clin Proc. 1998 Oct;73(10):956-9.

B. Web of Science search (n = 21; performed November 1, 2016)

1†: Tan, EK. **Chromosomal deletion at 22q11.2 and Parkinson's disease**. Lancet Neurol. 2016 May;15(6):538-40.

2*†: Mok KY, Sheerin U, Simón-Sánchez J, Salaka A, Chester L, Escott-Price V, Mantripragada K, Doherty KM, Noyce AJ, Mencacci NE, Lubbe SJ; International Parkinson's Disease Genomics Consortium (IPDGC), Williams-Gray CH, Barker RA, van Dijk KD, Berendse HW, Heutink P, Corvol JC, Cormier F, Lesage S, Brice A, Brockmann K, Schulte C, Gasser T, Foltynie T, Limousin P, Morrison KE, Clarke CE, Sawcer S, Warner TT, Lees AJ, Morris HR, Nalls MA, Singleton AB, Hardy J, Abramov AY, Plagnol V, Williams NM, Wood NW. **Deletions at 22q11.2 in idiopathic Parkinson's disease: a combined analysis of genome-wide association data**. Lancet Neurol. 2016 May;15(6):585-96.

3*†: Oki M, Hori S, Asayama S, Wate R, Kaneko S, Kusaka H. **Early-onset Parkinson's disease associated with chromosome 22q11.2 deletion syndrome**. Intern Med. 2016 Feb;55(3):303-5.

4†: Boot E, Butcher NJ, Vorstman JA, van Amelsvoort TA, Fung WL, Bassett AS. **Pharmacological treatment of 22q11.2 deletion syndrome-related psychoses**. Pharmacopsychiatry. 2015 Sep;48(6):219-20.

5*†: Rehman AF, Dhamija R, Williams ES, Barrett MJ. **22q11.2 deletion syndrome presenting with early-onset Parkinson's disease**. Mov Disord. 2015 Aug;30(9):1289-90.

6*: Dufournet B, Nguyen K, Grabli D, Broussolle E, Drapier S, Borg M, Houeto JL, Tosi CM, Defebvre L, Azulay JP. **The 22q11.2 microdeletion as a genetic cause to consider in case of early-onset Parkinson's disease**. Eur J Neurol. 2015 Jun;22(Issue S1):23.

7*: Butcher NJ, Marras C, Pondal M, Rusjan P, Christopher L, Strafella AP, Lang AE, Bassett AS. **Investigating prodromal markers of Parkinson's disease in adults with hemizygous 22q11.2 deletions**. Mov Disord. 2015 Jun;30(Supplement S1):400-1.

8†: Butcher NJ, Fung WL, Fitzpatrick L, Guna A, Andrade DM, Lang AE, Chow EW, Bassett AS. **Response to clozapine in a clinically identifiable subtype of schizophrenia**. Br J Psychiatry. 2015 Jun;206(6):484-91.

9: Bares M, Apps R, Kikinis Z, Timmann D, Oz G, Ashe JJ, Loft M, Koutsikou S, Cerminara N, Bushara KO, Kasparek T. **Proceedings of the workshop on cerebellum, basal ganglia and cortical connections unmasked in health and disorder held in Brno, Czech Republic, October 17th, 2013**. Cerebellum. 2015 Apr;14(2):142-50.

10*†: Boot E, Butcher NJ, van Amelsvoort TA, Lang AE, Marras C, Pondal M, Andrade DM, Fung WL, Bassett AS. **Movement disorders and other motor abnormalities in adults with 22q11.2 deletion syndrome**. Am J Med Genet A. 2015 Mar;167A(3):639-45.

11†: Ogaki K, Ross OA. **Chromosome 22q11.2 deletion may contain a locus for recessive early-onset Parkinson's disease**. Parkinsonism Relat Disord. 2014 Sep;20(9):945-6.

12*: Butcher NJ, Marras C, Pondal M, Christopher L, Strafella A, Fung WLA, Lang AE, Bassett AS. **Motor dysfunction in adults with hemizygous 22q11.2 deletions at high risk of early-onset Parkinson's disease**. Mov Disord. 2014 Nov;29(Supplement S1):S46.

13†: Jonas RK, Montojo CA, Bearden CE. **The 22q11.2 deletion syndrome as a window into complex neuropsychiatric disorders over the lifespan**. Biol Psychiatry. 2014 Mar 1;75(5):351-60.

14: Zhang YC, Zhang JQ, Xu JP, Wu X, Zhang YL, Feng H, Wang J, Jiang TZ. **Cortical gyrification reductions and subcortical atrophy in Parkinson's disease**. Mov Disord. 2014 Jan;29(1):122-26.

15*†: Butcher NJ, Kiehl TR, Hazrati LN, Chow EW, Rogaeva E, Lang AE, Bassett AS. **Association between early-onset Parkinson disease and 22q11.2 deletion syndrome: identification of a novel genetic form of Parkinson disease and its clinical implications**. JAMA Neurol. 2013 Nov;70(11):1359-66.

16: Hunsaker MR. **Comprehensive neurocognitive endophenotyping strategies for mouse models of genetic disorders. Prog Neurobiol**. 2012 Feb;96(2):220-41.

17: Goodrich-Hunsaker NJ, Wong LM, McLennan Y, Srivastava S, Tassone F, Harvey D, Rivera SM, Simon TJ. **Young adult female fragile X premutation carriers show age- and genetically-modulated cognitive impairments**. Brain Cogn. 2011 Apr;75(3):255-60.

18†: Liu X, Dobbie M, Tunningley R, Whittle B, Zhang YF, Ittner LM, Goetz J. **ENU mutagenesis screen to establish motor phenotypes in wild-type mice and modifiers of a pre-existing motor phenotype in tau mutant mice**. J Biomed Biotechnol. 2011 Dec:130947.

19*: Baudoin H, Jacquette A, Grabli D, Whalen S, Lenglet T. **The co-occurence of early onset Parkinson's disease (PD) and 22q11.2 deletion syndrome (22yDS): More than a coincidence**. Mov Disord. 2010 May;25(Supplement S2):468-69.

20†: Peng XR, Jia ZP, Zhang Y, Ware J, Trimble WS. **The septin CDCrel-1 is dispensable for normal development and neurotransmitter release**. Mol Cell Biol. 2002 Jan;22(1):378-87.

21*†: Krahn LE, Maraganore DM, Michels VV: **Childhood-onset schizophrenia associated with parkinsonism in a patient with a microdeletion of chromosome 22**. Mayo Clin Proc. 1998 Oct;73(10):956-9.

C. Search through library of personal PDF files (n = 5; performed November 1, 2016)

1: Vogels A, Verhoeven WM, Tuinier S, Devriendt K, Swillen A, Curfs LM, Frijns JP. **The psychopathological phenotype of velo-cardio-facial syndrome**. Ann Genet. 2002 Apr-Jun;45(2):89-95.

2: Verhoeven WM, Egger JI. **Atypical antipsychotics and relapsing psychoses in 22q11.2 deletion syndrome: A long-term evaluation of 28 patients**. Pharmacopsychiatry. 2015 May;48(3):104-10.

3: Arnold PD, Siegel-Bartelt J, Cytrynbaum C, Teshima I, Schachar R. **Velo-cardio-facial syndrome: Implications of microdeletion 22q11 for schizophrenia and mood disorders**. Am J Med Genet. 2001 May 8;105(4):354-62.

4: Merico D, Zarrei M, Costain G, Ogura L, Alipanahi B, Gazzellone MJ, Butcher NJ, Thiruvahindrapuram B, Nalpathamkalam T, Chow EW, Andrade DM, Frey BJ, Marshall CR, Scherer SW, Bassett AS. **Whole-genome sequencing suggests schizophrenia risk mechanisms in humans with 22q11.2 deletion syndrome**. G3 (Bethesda). 2015 Sep 16;5(11):2453-61.

5: Cheung EN, George SR, Costain GA, Andrade DM, Chow EW, Silversides CK, Bassett AS. **Prevalence of hypocalcaemia and its associated features in 22q11.2 deletion syndrome**. Clin Endocrinol (Oxf). 2014 Aug;81(2):190-6.

D. Additional records identified through colleagues (n = 4)

1: Mills KA, Reich SG. **Early onset Parkinson's disease and chromosome 22q11 deletion: Case report**. Ann Neurol 2016 Oct;80(S20):94.

2: Perandones C, Farini VL, Pellene LA, Sáenz Farret FM, Cuevas SM, Micheli FE, Radrizzani M. **Parkinson's disease in a patient with 22q11.2 deletion syndrome: The relevance of detecting mosaicisms by means of cell-by-cell evaluation techniques**. Single Cell Biol 2015;4(4):1-4.

3: Lopez-Rivera E, Liu YP, Verbitsky M, Anderson BR, Capone VP, Otto EA, Yan Z, Mitrotti A, Martino J, Steers NJ, Fasel DA, Vukojevic K, Deng R, Racedo SE, Liu Q, Werth M, Westland R, Vivante A, Makar GS, Bodria M, Sampson MG, Gillies CE, Vega-Warner V, Maiorana M, Petrey DS, Honig B, Lozanovski VJ, Salomon R, Heidet L, Carpentier W, Gaillard D, Carrea A, Gesualdo L, Cusi D, Izzi C, Scolari F, van Wijk JA, Arapovic A, Saraga-Babic M, Saraga M, Kunac N, Samii A, McDonald-McGinn DM, Crowley TB, Zackai EH, Drozdz D, Miklaszewska M, Tkaczyk M, Sikora P, Szczepanska M, Mizerska-Wasiak M, Krzemien G, Szmigielska A, Zaniew M, Darlow JM, Puri P, Barton D, Casolari E, Furth SL, Warady BA, Gucev Z, Hakonarson H, Flogelova H, Tasic V, Latos-Bielenska A, Materna-Kiryluk A, Allegri L, Wong CS, Drummond IA, D'Agati V, Imamoto A, Barasch JM, Hildebrandt F, Kiryluk K, Lifton RP, Morrow BE, Jeanpierre C, Papaioannou VE, Ghiggeri GM, Gharavi AG, Katsanis N, Sanna-Cherchi S. **Genetic Drivers of Kidney Defects in the DiGeorge Syndrome**. N Engl J Med 2017;376:742-754.

4: Butcher NJ, Marras C, Pondal M, Rusjan P, Boot E, Christopher L, Repetto GM, Fritsch R, Chow EWC, Masellis M, Strafella AP, Lang AE, Bassett AS. **Neuroimaging and clinical features in adults with a 22q11.2 deletion at risk of Parkinson's disease**. Brain. 2017 [Epub ahead of print].