The Co-TELE-SURGE Study

Preoperative and postoperative **Co**gnitive **T**raj**E**ctories in o**L**d**E**r patients with deferred **SURGE**ry due to the COVID-19 emergency:
a prospective cohort study

Short title (max 25 characters): Deferred surgery @COVID19

Protocol Version 3
May 31, 2020

STUDY SUMMARY

Title	**The Co-TELE-SURGE Study** Preoperative and postoperative **Co**gnitive **T**raj**E**ctories in o**L**d**E**r patients with deferred **SURGE**ry due to the COVID-19 emergency: a prospective cohort study
Project Office	Department of Health Research Methods, Evidence, and Impact McMaster University 1280 Main St West, Hamilton, Ontario, Canada L8L 2X2
Study Size	330 patients
Study Design	Multicentre, prospective and longitudinal, cohort study
Primary Objectives	In older patients whose elective noncardiac surgery has been deferred because of the COVID-19 emergency, 1) to describe perioperative cognitive trajectories, and 2) to explore the intra-individual changes in these trajectories from before to after surgery.
Secondary Objectives	In older patients whose elective noncardiac surgery has been deferred because of the COVID-19 emergency, 1) to describe the perioperative trajectories in depressive symptoms and pain, and 2) to explore their association with the trajectories in cognitive performance.
Eligibility Criteria	***Inclusion criteria*** 1. age 65 years or greater 2. patient scheduled to perform noncardiac elective surgery expected to require at least an overnight stay in hospital after surgery 3. surgery deferred, with a known or probable surgery date in ≥6 weeks 4. informed consent provided ***Exclusion criteria*** 1. patient undergoing cardiac surgery, or cranial surgery 2. known history of dementia 3. unavailability of tablet or computer with an internet connection for remote assessment 4. patient unable to interact with a tablet or computer due to language, visual, or hearing impairment, or any severely limited mobility of the upper limb joints 5. patient unable to understand spoken or written English 6. surgery delayed for a intercurrent clinical event
Follow-up and measurements	At enrolment and monthly before surgery (i.e. ≥2 preoperative assessments per patient), and then 1 month, 3 months, 6 months, and 12 months after surgery, patients will be assessed remotely 1. on their cognitive performance, through a computerized brief cognitive test battery, self-administered, i.e. the Cogstate Brief Battery (CBB) 2. on their physical function/mobility, through the Function Component of the Late-Life Function and Disability Instrument (LLFDI-FC) and exploring life space mobility

	3. on their depressive symptoms, through the short form (15-item) version of the Geriatric Depressive Scale (GDS) 4. on their pain, through a Numeric Pain Rating Scale (NPRS)

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1. BACKGROUND AND RATIONALE

The COVID-19 emergency has been impacting our patients and healthcare systems in several ways. To redeploy resources (staff and equipment) to priority areas, ensure hospital capacity to front the COVID-19 surge, and for infection control reasons, the use of operating rooms have been limited mainly to semi-urgent (e.g., oncology), urgent (e.g., hip fracture) and emergency (e.g., ruptured abdominal aortic aneurysm) surgeries, while many elective surgeries have been deferred to a later, often undermined, time. From a societal perspective, this is certainly thought to be the best choice in such an emergency. From an individual perspective this is going to represent a stressful situation for those patients, often older, whose surgery is not happening as planned.

On the other side, from an epidemiological perspective, this represents a unique opportunity to study the impact of surgery on cognitive performance. Postoperative cognitive dysfunction (POCD) is an objectively measured decline in cognition postoperatively compared with preoperative function.[1 2] The NeuroVISION study demonstrated that as many as 30% of patients aged 65 or older undergoing elective noncardiac surgery experience cognitive decline at 1 year after surgery, defined as ≥2 point decline in the Montreal Cognitive Assessment compared with before surgery.[3] This has questioned the role of surgery in cognitive decline. Many of these patients have several comorbidities, which, in addition to age, could theoretically impact their cognitive performance over time. Therefore, it is still uncertain whether the decline we see in these patients who underwent surgery is different from what we would have seen if the same patients had not undergone surgery. An epidemiological study could try to answer this question comparing the surgical cohort with a matched non-surgical cohort. However, whatever matching approach we use, the control group is always going to be imperfect, and undoubtedly inferior to an approach that compares the individual with themselves. However, when we evaluate the effect of surgery comparing the patient cognitive performance at a certain time point after surgery with the cognitive performance measured at only one time point before surgery, we miss considering a possible pre-existing trend over time before surgery, which could hypothetically explain the change after surgery.

While for some surgeries, a waiting time to surgery of months is not an unusual eventuality (e.g., some elective orthopaedic surgeries), this is a more unique circumstance for other major elective noncardiac surgeries. Therefore, to identify surgical candidates time before their surgery, and follow them up for a certain time before their surgery is often impracticable. Due to the COVID-19 contingency, we now have a sample of patients that, due to the deferral of their surgery we are capable of following and assessing for their cognitive status before they receive their surgery, for one to a few months. In this way, we will be able to draw preoperative individual-specific trajectories of cognitive performance, which represent an intra-individual comparison to the postoperative cognitive performance, to evaluate the relative and absolute impact of surgery on our older patients.

We expect that the COVID-19 pandemic, and the imposed social distancing, is having an impact on older patient lives, and also on older patients that are waiting for their surgery. Changes in their ability to live a normal life because of the current restrictions might translate into changes in their physical performance, and might have an impact on their mood and also on their perception of pain, and eventually translate into changes in their cognitive performance. The deferral of their surgery *per se*, and the possible adoption of adjuvant

therapies in the meantime, might have, at least theoretically, an influence on their overall performance. For all these reasons, we might see a different preoperative cognitive trajectory, compared with what we would have seen in a non-COVID-19 time. However, if surgery has an impact on our patient cognition, we still expect to see it as a postoperative change (e.g. a greater decline, a change in slope) compare to their actual preoperative trajectory, so that the performance we see at 3, 6 or 12 months after surgery is worse than what we would expect based on the preoperative trajectory.

The use of computerized cognitive testing in older people has incredibly expanded in recent times. The existing literature confirms the strengths of this approach, which include standardization of administration and stimulus presentation, accurate measures of response, and efficiencies of staffing and cost, and supports feasibility and acceptability.[4 5] Computerized testing allows also for remote cognitive assessment, which has been shown feasible and reliable also in older subjects, also with some cognitive impairment.[6 7] In the era of physical and social distancing imposed by the COVID-19 emergency, this is particularly relevant. Moreover, since virtual and telecommunication tools have become a daily vehicle for maintaining some type of encounter with our patients, more older patients are becoming familiar with these types of encounters and tools.

2. OBJECTIVES

The primary objectives of our project are to describe perioperative cognitive trajectories of older patients whose elective noncardiac surgery has been deferred because of the COVID-19 emergency, and explore the intra-individual changes in these trajectories from before to after surgery, through periodic remote self-administered cognitive testing.

In the same study population, we will also have the following secondary objectives:

- to describe the perioperative trajectories in mobility/physical function, depressive symptoms and pain, and explore their association with the trajectories in cognitive performance, before and after surgery;
- to describe the change in activities and participation after the COVID-19 and social distancing started, in our study population, compared to a random sample of community-dwelling persons, 65 years old or older, in order to identify the additional impact of surgery deferral. We will pursue this secondary objective comparing our data with the results of an ongoing cross-sectional survey across community-dwelling older adults living in Greater Hamilton areas.

3. METHODS

3.1 Study design

Our project is a multicentre, prospective and longitudinal, cohort study.

3.2 Study population

We expect to include 330 patients aged 65 years or older, scheduled for their noncardiac elective surgery whose surgery has been or will be deferred due to the slowdown of the operating rooms during the COVID-19 emergency at the Hamilton Health Science (HHS), St. Joseph's Healthcare Hamilton (SJHH), Woodstock General Hospital, London Health Sciences

Centre, Kingston General Hospital, Memorial University of Newfoundland, University of Saskatchewan, and University of Alberta.

3.2.1 Inclusion criteria

1. age 65 years or greater
2. patient scheduled to perform noncardiac elective surgery expected to require at least an overnight stay in hospital after surgery
3. surgery deferred, with a known or probable surgery date in ≥6 weeks
4. informed consent provided

3.2.2 Exclusion criteria

1. patient undergoing cardiac surgery, cranial surgery
2. known history of dementia
3. unavailability of tablet or computer with an internet connection for remote assessment
4. patient unable to interact with a tablet or computer due to language, visual, or hearing impairment, or any severely limited mobility of the upper limb joints
5. patient unable to understand spoken or written English
6. surgery delayed for an intercurrent clinical event

3.3 Recruitment and procedures

Eligible patients will be first approached by members of their circle of care. We have engaged surgeons from different disciplines at the participating sites. and we will distribute (via email) study information, including eligibility criteria, across surgical practices. The study team will be in periodic contact with surgical practices to look for potential participants. Members of the patient circle of care will ask the potential participants for permission to share their contact with the research team. The study will be then all conducted remotely, by videoconference (baseline) or telephone (follow-ups), with McMaster University as the coordinating and assessment centre. The study team will be in periodic contact with the participating surgical practices to look for potential participants. An informed verbal consent will be sought. After the first contact of the research team with the patient, an informative written document including the same information conveyed during the verbal consent process will be sent to the participant using the same email address that will be used during the study to deliver the link to the computerized tests. At the next call, once the patient has had a chance to review the document, the research personnel will look for confirmation of their consent to participate, before proceeding to any assessment.

If the patient agrees to participate, the patient will be allowed, if necessary, to involve in the study a next of kin or support who can help facilitate the access to an electronic device with an internet connection which will be used to administer the cognitive battery remotely, and the training on the battery.

The research team will set up an initial videoconference with the participant (and the next of kin/support if necessary) to explain the Cogstate Brief Battery (CBB), i.e. the internet-based cognitive testing, and train on self-administration. Zero to 3 days before each scheduled cognitive assessment the participant (or the next of kin/support) will be emailed a user-specific

link to the cognitive program. Around the same time the participant will receive a telephone call to remind to complete the assessment.

The baseline videoconference-based visit with the patient will be conducted using different software options, as long as they allow screen sharing, including Skype and Zoom, based on availability and participant discretion. The subsequent calls will be done using the telephone.

We will seek confirmation of consent to participate in the study during the initial videoconference, and at every telephone contact with the patient throughout the study.

3.4 Measurements

At the initial videoconference, data on baseline characteristics will be collected, including demographics, social history, comorbidities, and relevant pharmacological and non-pharmacological (e.g. radiation) therapies. At the initial videoconference the questionnaire to explore change in activities and participation since COVID-19 will be also administered.

At each of the calls that will remind the self-administered cognitive assessment, the research team member will also

1) ask about any clinically relevant intercurrent event (i.e. hospital admissions, ED visits, visits to urgent care, changes in medications);

2) assess mobility/physical function based on the Late Life Function and Disability Instrument: Function Component (LLFDI), and life space mobility questions

3) assess depressive symptoms using the Geriatric Depression Scale (GDS)

4) assess pain using a Numeric Pain Rating Scale (NPRS)

Data on the participant past medical history, medication, date and type of surgery, postoperative course, and intercurrent clinical events will be obtained from the interview with participant, and confirmed or completed through review of electronic hospital medical records, based on the execution of a Data Transfer Agreement between McMaster University and Hamilton Health Sciences Corporation. If needed, for data completion or clarification, the participant's family physician will be also contacted.

APPENDIX I summarizes the study timeline and measurements.

3.4.1 Cogstate Brief Battery (CBB)

The Cogstate Brief Battery (https://www.cogstate.com) is a computer-based cognitive test extensively validated against standard neuropsychological batteries in cognitively normal older adults, as well as in patients with cognitive impairment, in the community and in different clinical contexts, both in a clinician/researcher-supervised manner, and in an unsupervised fashion (i.e., through an internet-based self-administration, at home). [8-10] It has been used also in the perioperative setting, showing equivalent or greater reliability, and greater sensitivity than conventional batteries.[11 12] Moreover, In addition to proof of feasibility and acceptability even with older patients with some baseline cognitive impairment, its advantages are short duration (about 15 min), small practice effects (even with monthly assessments), and no ceiling effects.[8 13] It consists of four tasks (*Detection Task*, *Identification Task*, *Learning Task*, and *One-Back Task*) designed to assess psychomotor function, attention, working memory, and visual learning.[13] Each task utilizes stimuli in the form of playing cards. Stimuli characteristics (e.g.,

color, suit) are manipulated based on the requirements of each task. The primary performance measure for the *Detection* and *Identification* tasks is reaction time in milliseconds (speed), which is usually normalized using a logarithmic base 10 ($\log_{10}$) transformation. The primary performance measure for the *Learning* and *One-Back* tasks is the proportion of correct answers (accuracy), which is usually normalized using an arcsine square-root transformation.

Based on industry web standards, the Cogstate system will communicate with the McMaster system through an Application Programming Interface (API), to generate user- and visit- specific links. The CBB will be host in a McMaster webpage, in a seamless fashion for the participant, who will be directed into the Cogstate application when they start the assessment, and then back to the hosting website upon completion of the tests. The CBB will present each cognitive test to the subject following a self-paced training test until valid cognitive data is provided, enabling testing without supervision. Subjects will receive a simple message at the end of their testing session indicating next steps. A detailed report with cognitive data will not be provided to subjects. For the purpose of this study, a support person will be allowed to attend the self-administration of the CBB. This will be established at the enrolment for each participant, and the participant will be instructed to self-administer the CBB under the same conditions at every assessment over time.

After 1-5 days from the initial recruitment and training session, each participant will self-administer the cognitive testing once, and then every month (i.e. 30 days, ±1 week) until their surgery is performed. We expect that each participant will have at least 2 assessments before surgery. Participants will then self-administer the CBB 1 month, 3 months, 6 months, and 12 months after surgery.

3.4.2 Changes in activities and participation since COVID-19 questionnaire

Appendix III shows the questionnaire exploring changes in activities and participation since COVID-19. The questionnaire has been developed in the context of a survey study that is being conducted by investigators at the McMaster Institute for Research on Aging (MIRA) & Labarge Centre for Mobility in Aging (LCMA). In the MIRA/LMCA survey the questionnaire is administered, by telephone, to 500 community-dwelling older adults living in Greater Hamilton area, identified through random sampling based on census. In the Co-TELE-SURGE the questionnaire will be administered by the research personnel only once, i.e. at baseline, to collect data on the change in activities and participation experienced by the subject after the social distancing was imposed to face the COVID-19 pandemic, which, for the participants in our study temporally coincided with the change to their surgical plan.

3.4.3 Late Life Function and Disability Instrument: Function Component (LLFDI-FC)

The Function Component of the Late-Life Function and Disability Instrument (LLFDI-FC) is a widely used patient-reported outcome of physical function.[14 15] It comprehensively assesses discrete functional tasks and operationalizes disability in important life roles beyond the narrow construct of activities of daily living. Extensive evidence supports its construct validity and sensitivity to change among various clinical populations of community-dwelling older adults.[16] The instrument will be administered over the phone by the research personnel at each follow-up, preoperatively and postoperatively. Three additional questions will be also asked to explore life space mobility (being just outside the house, being in the neighborhood, and being outside

the neighborhood), which will also capture changes in social distancing policy that we expect will happen over the study period. At the end of the mobility questionnaire, the participants will be also asked whether there have been changes in their ability of performing basic and instrumental activities of daily living.

3.4.4 Geriatric Depression Scale (GDS)

The short form (15-item) version of the GDS[17] is widely used instrument, which has demonstrated good reliability and validity in assessing depressive symptoms in older adults. The GDS Short Form takes an average of 5 to 7 min to complete and will be administered by the research personnel on the phone.

3.4.5 Numeric Pain Rating Scale (NPRS)

The Numerical Pain Rating Scale (NPRS) is a rapid subjective measure of pain in which individuals rate their pain on an eleven-point numerical scale. The scale is composed of 0 (no pain at all) to 10 (worst imaginable pain). Correlation with other pain-assessment tools and feasibility of its use also in telephone interviews, have been demonstrated.[18] The NPRS will be administered by the research personnel on the phone.

3.5 Sample size

The slowdown of the operating rooms due to COVID-19 started in mid-March, and it will last at least until the end of June or July at the participating sites. We expect to recruit 330 participants between May and August 2020. This sample size will be sufficient to test our primary hypothesis that, on average, in our population, the cognitive performance at 6 months after surgery will be worse, in a clinically significant way, compared to what we would expect based on the preoperative trajectory. We will base our primary hypothesis on the performance at the *One-Back Task (OBK)* of the CBB, at 6 months after surgery. The *OBK* assesses working memory, which is a cognitive domain often found altered in the context of postoperative cognitive dysfunction. It uses a well-validated n-back paradigm with stimuli from playing cards. The subject is asked whether the card displayed in the center of the screen is the same as the card presented immediately before. The subject responds by pressing the “yes” or “no” key. The primary outcome variable for this test is accuracy of correct response, normalized using an arcsine square-root transformation. In **APPENDIX II** we provide a table summarizing the clinical relevance of the test and its results, with data on the difference in performance between healthy older adults, and older adults with mild cognitive impairment (MCI) or dementia based on standardized neuropsychological assessment.[13 19] Based on the literature, a typical score of healthy older adults is 1.35; the average difference, at one time point, in the *OBK* score, between healthy older adults and older adults with mild cognitive impairment (MCI), and older adults with dementia, is, respectively, 0.07 and 0.17.[13 19] We hypothesize that in our study population we will see a preoperative trajectory, which, if it continued, unchanged, after surgery (H_o), would lead to an average decrease in OBK score of 0.009 over 6 months. This is still consistent with a decline over time compared with what we would expect on average in a healthy older population.[13 19] Our hypothesis (H_1) is that surgery will change the preoperative trajectory so that at 6 months after surgery we will instead see an average decrease, compared with right before surgery, of 0.035 (which would correspond to the average change in a hypothetical population in which 40% of subjects experience a decline of at least 0.07, 50% no

change, and 10% an improvement of 0.07). Based on a test of comparison of means in one sample, with an alpha error of 0.05 (2-tailed), and a standard deviation for the OBK score of 0.16,[13] to enrol 330 subjects will be sufficient to test our hypothesis with 80% of power, even in case of an attrition rate as high as 10%.

Recruiting 330 participants is a feasible goal based on the current status of knowledge about the COVID-19 contingency plan. The lockdown of the operating rooms started in March and will last at least until the end of June, or longer, depending on the participating site. During the lockdown, we expect to be able to enroll at least 120 participants at McMaster sites, and 30-50 participants at each of the other participating sites. Even when the operating rooms will reopen to more elective surgeries in the next months, this will happen slowly, so that we expect a carryover of the lockdown at least until the end of the summer. Moreover, it is projected that, if countries increase their normal surgical volume by 20% post-pandemic, it would take a median 45 weeks to clear the backlog of operations resulting from COVID-19 disruption.[20] Therefore should we see a recruitment rate slower than expected, for any reason, we will extend our recruitment period to beyond the summer.

3.6 Data analysis plan

Using descriptive statistics, we will present demographic and clinical baseline characteristics of our study population.

3.6.1 Primary analysis

We will report descriptive summary statistics of the performance of the study population at each of the 4 CBB tasks for each of the preoperative and postoperative time points. We will also represent individual and averaged performance trajectories graphically.

To explore whether surgery has a statistically significant impact on cognitive performance and its trajectories, we will model data using interrupted time series analyses. Interrupted time series analysis is a powerful quasi-experimental design to study the longitudinal effects of interventions or exposures, accounting for pre-intervention/pre-exposure trends. We will adopt the approach described in Kontopantelis *et al*., *BMJ 2015*.[21 22] According to this approach we will use regression models in which the within patient performance variation over time is partitioned into three main components, to provide independent tests for the slope in scores in the pre-operative period (test 1); the change in level (i.e., absolute change) around surgery, allowing for the trend before surgery (test 2); and the change in slope from before to after surgery (test 3).[21 22] The preoperative slope quantifies the trend in performance before surgery. The level change is an estimate of the absolute change in cognitive performance that can be attributed to surgery, i.e., between the time points immediately before and immediately after surgery, and accounting for the preoperative trend. The change in slope quantifies the difference between the preoperative and postoperative slope. Based on the hypothesis that the postoperative trajectory will not be homogenous over the 12 months after surgery, we will also adopt a more complex interrupted time series model that will allow for different slopes of change in different time segments, i.e. right before to 1 month after surgery, 1-3 months, 3-6 months, and 6-12 months after surgery.[23] We will conduct the primary analysis first considering only the early-intermediate postoperative performance (up to 6 months after surgery). With the assumption that the

impact of surgery can last as long as one year,[2] we will repeat the analysis including also the change between 6 and 12 months after surgery. In our regression models, we will use estimates of error variance obtained from bootstrap techniques using 1000 bootstrap samples.We will analyze the performance at each task separately, and then combining the 4 scores into one unique measure of performance. We will explore whether clinically significant changes have occurred at any time point. There is no standard definition for what is a clinically significant perioperative decline across different tests.[24 25] In addition to the change as defined in our sample size calculation (i.e. a change in score equal to or greater than the average difference in scores between a healthy older adult and a subject with MCI), we will consider also 2 most commonly adopted definitions, i.e. 1) a change of ≥20% in test scores,[26] and 2) a reliable change index (RCI) of ≥1.65. The RCI is an index commonly used in neuropsychology,[27] and also in studies using the CBB,[13] calculated by dividing the individual's test-retest difference score by the standard error of that difference score, and can be interpreted as a standard Z score. The cut-off of RCI=1.65 is the point beyond which 5% of the values from the normal sample population will fall (i.e. P<0.05, one tailed test). We will compare the performance scores at each time point with the preceding time points, and evaluate the changes based upon these criteria. We will provide the number and percentage of patients experiencing a cognitive decline based on these definitions at each of the segments of the observation period. We will also compare our study population data with existing age-stratified normative data for the CBB.[28]

In our primary analyses, we will include only patients who completed ≥2 assessments preoperatively and ≥3 assessments (i.e. 1, 3, and 6 months) postoperatively. Secondarily, we will repeat our analysis dealing with missing data 1) through multiple imputation techniques; and 2) using a method of evidence-informed data imputation, previously implemented in our studies, which takes onto account the reason for the missing data.[3]

3.6.2 Secondary Analyses

We will explore whether the effect of surgery on cognitive trajectories differ based on baseline patient characteristics, including age, type of surgery, cognitive performance at baseline, comorbidities, mobility, GDS and pain score. This will be done studying the interaction of these covariates with the components of the interrupted time analysis. The interrupted time series approach as described assumes linearity and constancy of the preoperative trend when projected postoperatively. We will evaluate the validity of these assumptions exploring the association of changes in cognitive performance with intercurrent events other than the index surgery, for the long-term effects.

With a similar approach as for the cognitive performance, we will study the perioperative trajectories of patient physical function/mobility (as indicated by the LLFDI-FC and the life space mobility questions), depressive symptoms (as indicated by the GDS), and of pain (as indicated by the NPRS). We will also explore whether the time-dependent LLFDI-FC, GDS and NPRS scores are associated with the time-dependent cognitive scores.

STATA software, version 15, will be used for the analyses.

4. IMPORTANCE OF THE STUDY

Capitalizing on one of the unfortunate consequences of the COVID-19 emergency, i.e. the deferral of many elective surgeries, our study will provide a unique insight into the role of surgery on perioperative and postoperative cognitive trajectories in older patients. At the same time, the study will enlighten on trajectories of patient reported outcomes, such as mobility, mood, and pain, in patients waiting for their delayed surgery in the COVID-19 era.

Our study will be also a proof of concept for a perioperative study design, which could be applied to a larger scale, and to other perioperative outcomes.

Finally, as an unintended positive consequence, this study will translate into a periodic tele-contact with older patients who, during and after the COVID-19 pandemic, will most suffer the consequences of the social distancing.

APPENDIX I. Study timeline, measurements, and data collection

	Before surgery			After surgery							
Measurement	**- ≥6 weeks**	**Monthly**		**+1 mo**		**+3 mo**		**+6 mo**		**+12 mo**	
	Videoconference with research team	**Reminder call with research team***	**Patient self-administered**	**Reminder call with research team***	**Patient self-administered**	**Reminder call with research team***	**Patient self-administered**	**Reminder call with research team***	**Patient self-administered**	**Reminder call with research team***	**Patient self-administered**
Verbal consent (confirmation)	x	x		x		x		x		x	
Sociodemographic and clinical data	x										
Intercurrent clinical events**		x		x		x		x		x	
Information on index surgery				x							
Cogstate Brief Battery (CBB)			x		x		x		x		x
Change in activities and participation due to COVID-19	x										
Late-Life Function and Disability Instrument (LLFDI-FC) and life space mobility		x		x		x		x		x	
Geriatric Depression Scale (GDS)		x		x		x		x		x	
Numeric Pain Rating Scale (NPRS)		x		x		x		x		x	

*0-3 days before the expected self-administered cognitive assessment

**hospital admissions, ED visits, visits to urgent care, changes in medications

APPENDIX II. Performance at the Cogstate One-Back Task (OBK): interpretation and clinical relevance of changes in score

From Lim 2013[13] and Mackin 2018[19]

Baseline score (SD) in HA	Average difference in score between HA and persons with MCI at any time point (Cohen's d)	Average difference in score between HA and persons with dementia at any time point (Cohen's d)	Score change per every additional year of age (population level)
1.35 (0.16)	0.07 (0.60)	0.17 (2.40)	-0.004

HA – healthy older adults
MCI - subjects with mild cognitive impairment

APPENDIX III. Changes in activities and participation since COVID-19 questionnaire

In the next set of questions, we will ask you about how your perceived functional ability and daily activities have changed since social distancing began due to COVID-19. You can reply by the following 5-point scale: much worse, a little bit worse, stayed about the same, a little bit better, much better.

Activities	**Much Worse**	**A little bit worse**	**About the same**	**A little better**	**Much better**
Your ability to move around in your home (such as walking, climbing stairs) become …					
Your ability to engage in sports or recreational activity (such as casual/brisk walking, dancing, bowling, shuffleboard, hiking, Yoga, gymnastics, stationary bike,) become …					
Your ability to engage in housework activity (such as dusting, washing dishes, and vacuuming) become …					
Your ability to stay physically active (walking, exercise, working out) become..					
Participation	**Much Worse**	**A little bit worse**	**About the same**	**A little better**	**Much better**
Since social distancing began due to COVID-19 has …					
Your ability to keep in touch with others (through letters, cell phone/phone or email) become …					
Your ability to take care of your health (such as managing daily medications, following a diet, cooking your own meals, bathing, dressing and toileting) become …					
Your ability to take care of your errands (such as buying groceries or taking care of finances) become …					
Your ability to participate in the community and maintain a social life (e.g., volunteer, go to church, meet with others) become…					

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