“Staying Nimble”

Adapting to meet telemedicine needs for the Care of Parkinson's Disease

Daryl Wile, MD, FRCPC
(Neurology and Movement Disorders)
Presented from Kelowna, BC 2020 July 7

Parkinson.bc.ca

For resources, contact info and support

WARMUP

pollev.com/darylwile627

When poll is active, respond at **PollEv.com/darylwile627**

Text **DARYLWILE627** to **22333** once to join

What's your connection to PD?

I am a person with a condition like PD

I am a person living with PD

I have a friend or loved one living with PD

I work in healthcare, advocacy or support

How satisfied are you with medical care of your PD during the COVID-19 Pandemic?

Have you been able to maintain self-care (exercise, social connections) during COVID-19?

What is your biggest health concern during the last few months?

GOALS

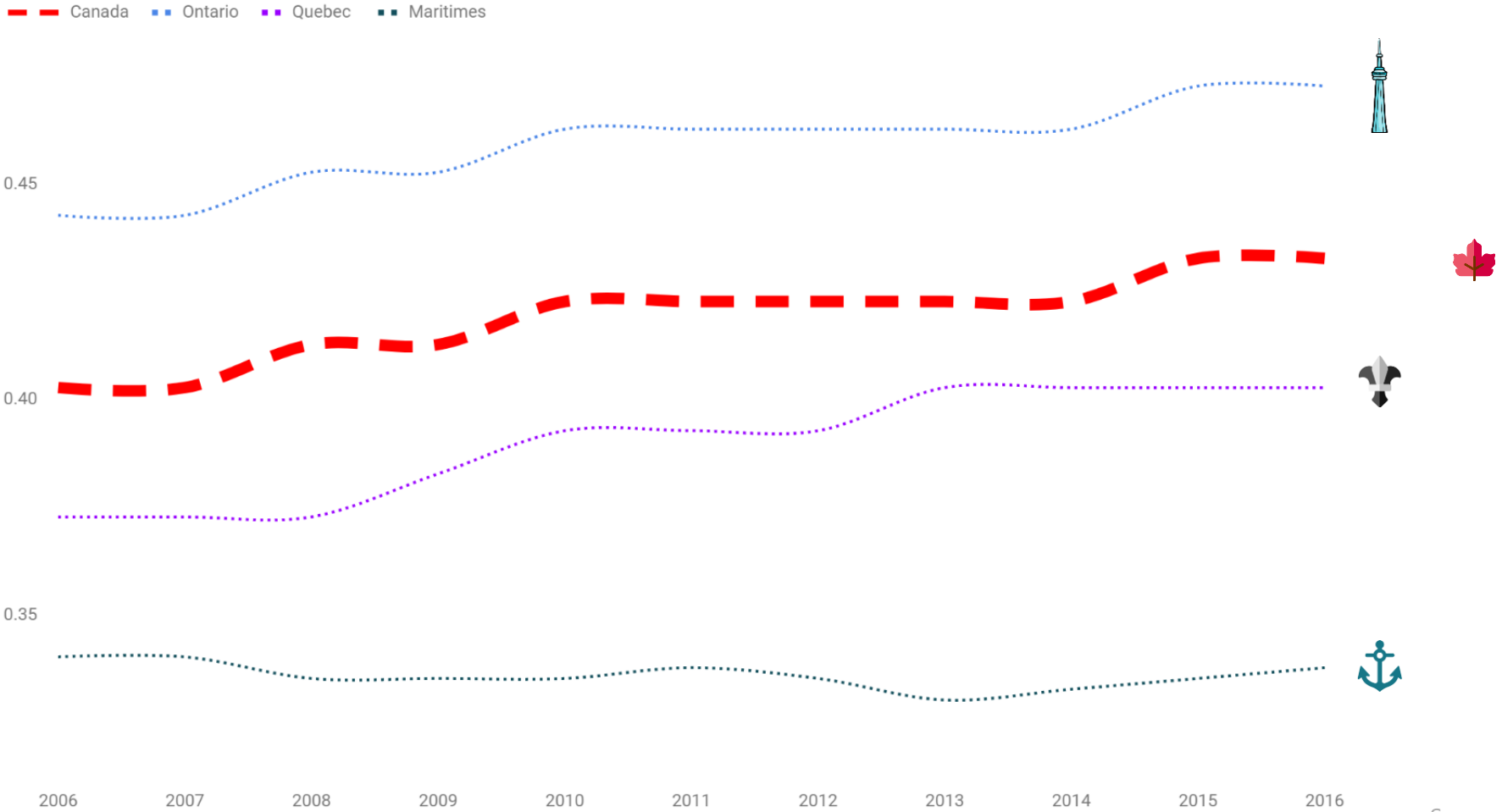
Regional differences in access to neurological care: now and then

Discuss: strengths and weaknesses of “virtual care” for different medical issues

Reflect: how COVID-19 has changed priorities and challenged routines

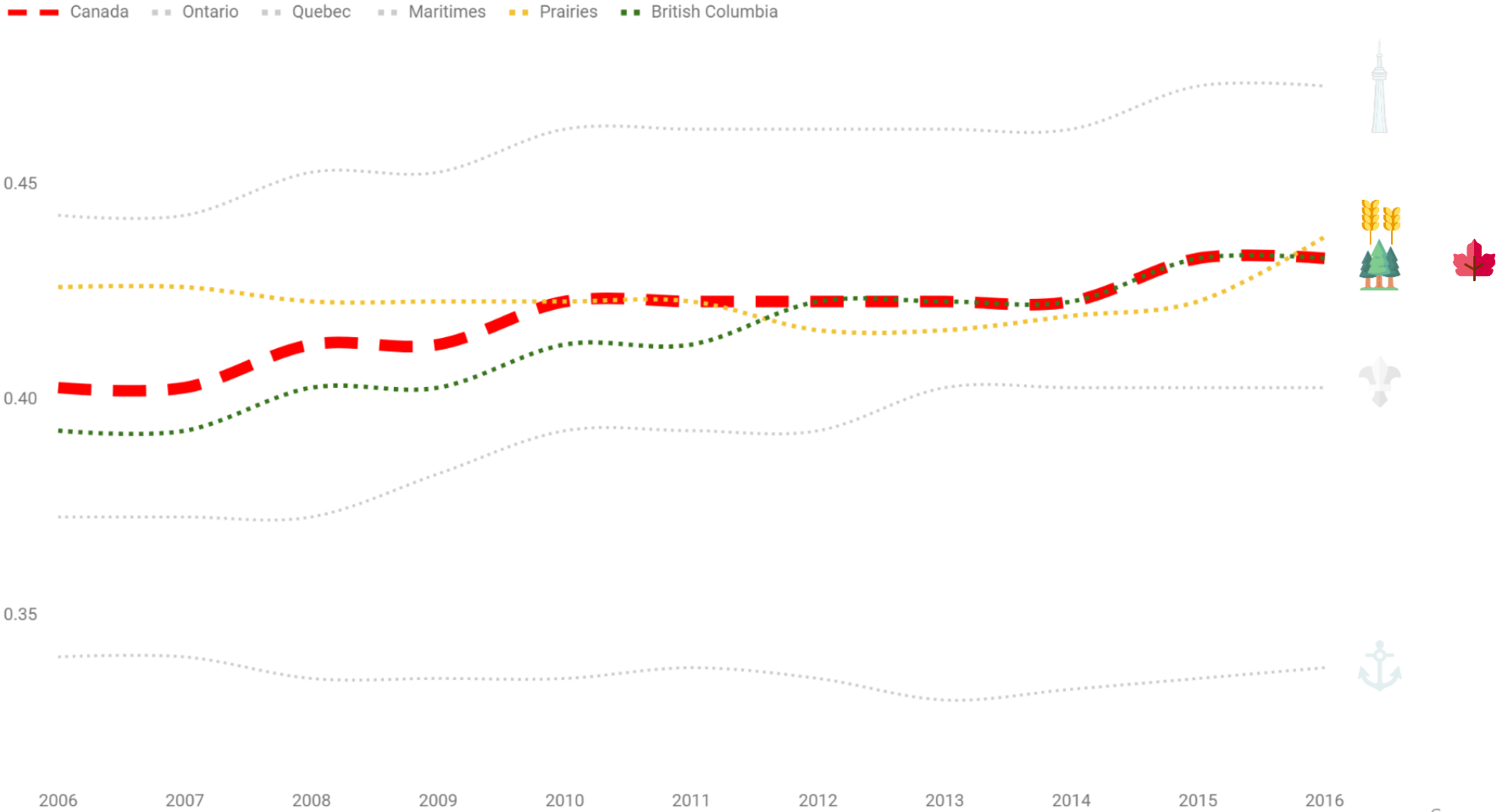
Explore: solutions to these challenges

Regional Prevalence of Parkinsonism: Canada 2004-2016



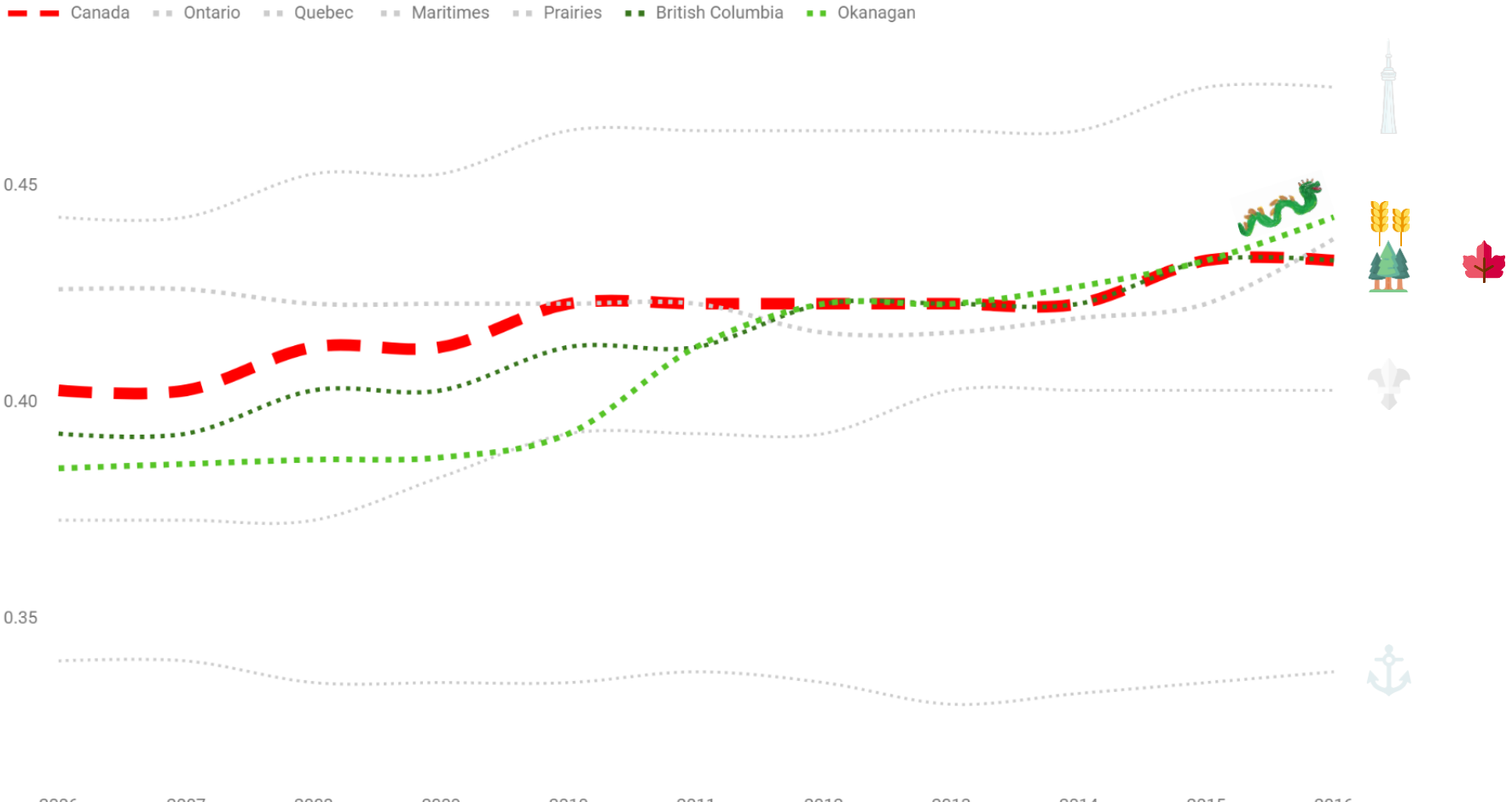
Source: PHAC

Regional Prevalence of Parkinsonism: Canada 2004-2016



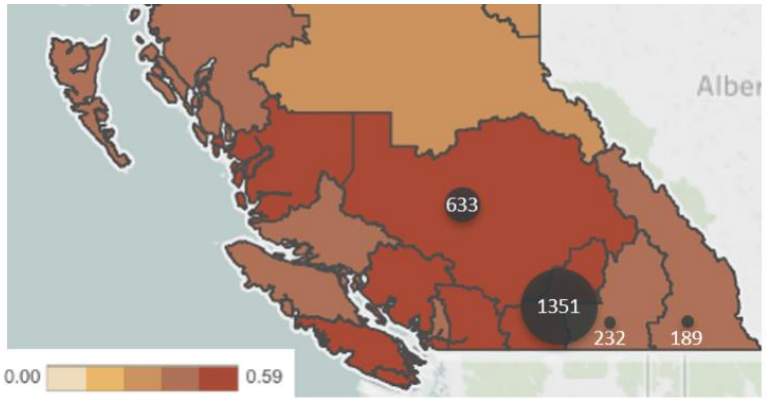
Source: PHAC

Regional Prevalence of Parkinsonism: Canada 2004-2016



Source: PHAC

Northern Health	494	(0.34)
Interior Health	2405	(0.52)
Island Health	2649	(0.56)
Vancouver Coastal	3067	(0.48)
Fraser Health	4480	(0.49)
British Columbia	13095	

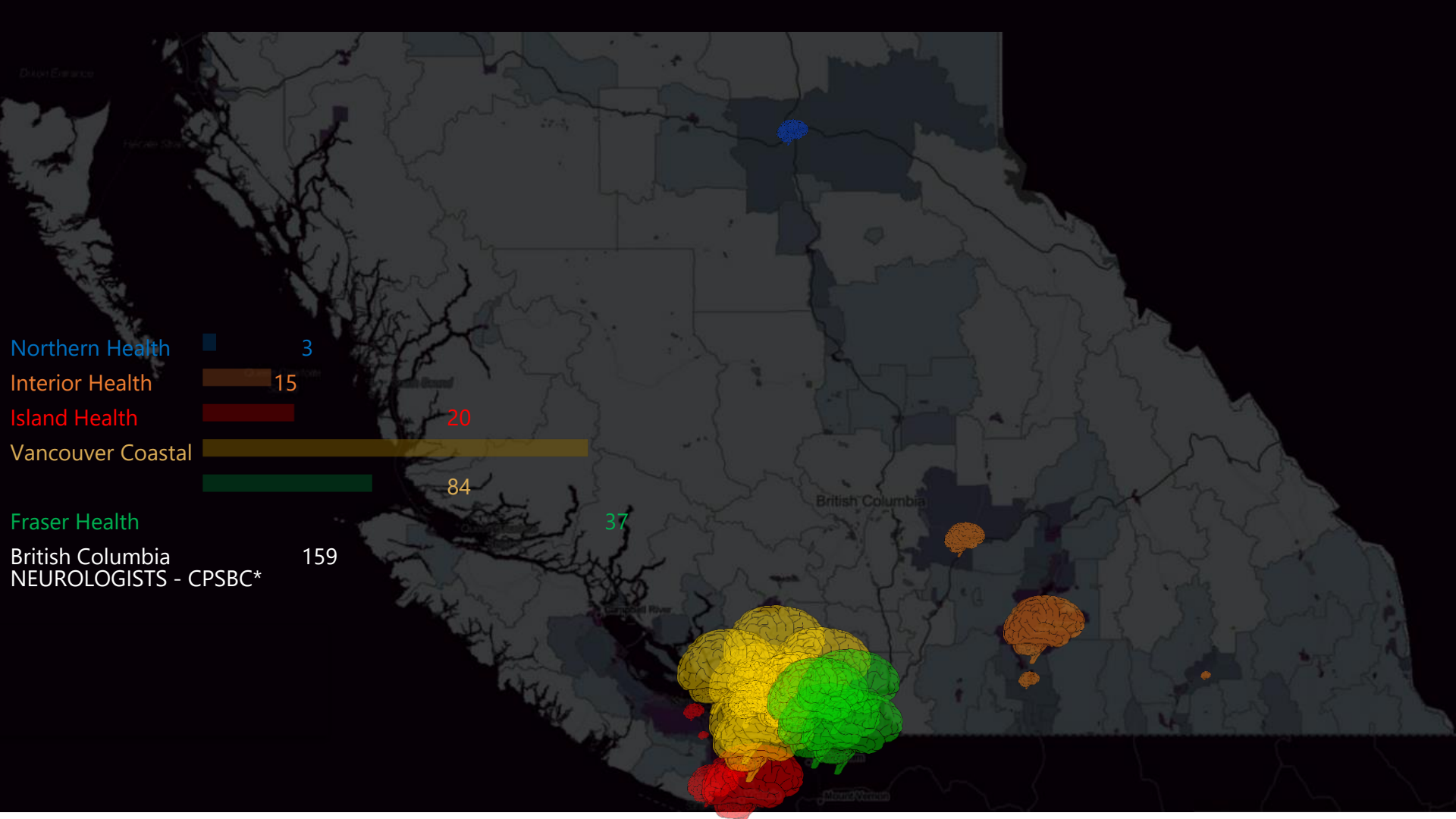


2016-2017

Source: BCCDC Chronic disease dashboard

Movement disorder clinic progress

Year	Visits / month
2015	69
2016	124
2017	128
2018	112
2019	116


Northern Health 3
Interior Health 15
Island Health 20
Vancouver Coastal 84
Fraser Health 37
British Columbia 159
NEUROLOGISTS - CPSBC*
British Columbia

Challenges in “Virtual care” for PD

- It’s complicated
- Treatment depends on the exam
- The exam is tricky
- A careful assessment is especially important for the first assessment
- Some treatments must be done / adjusted in person

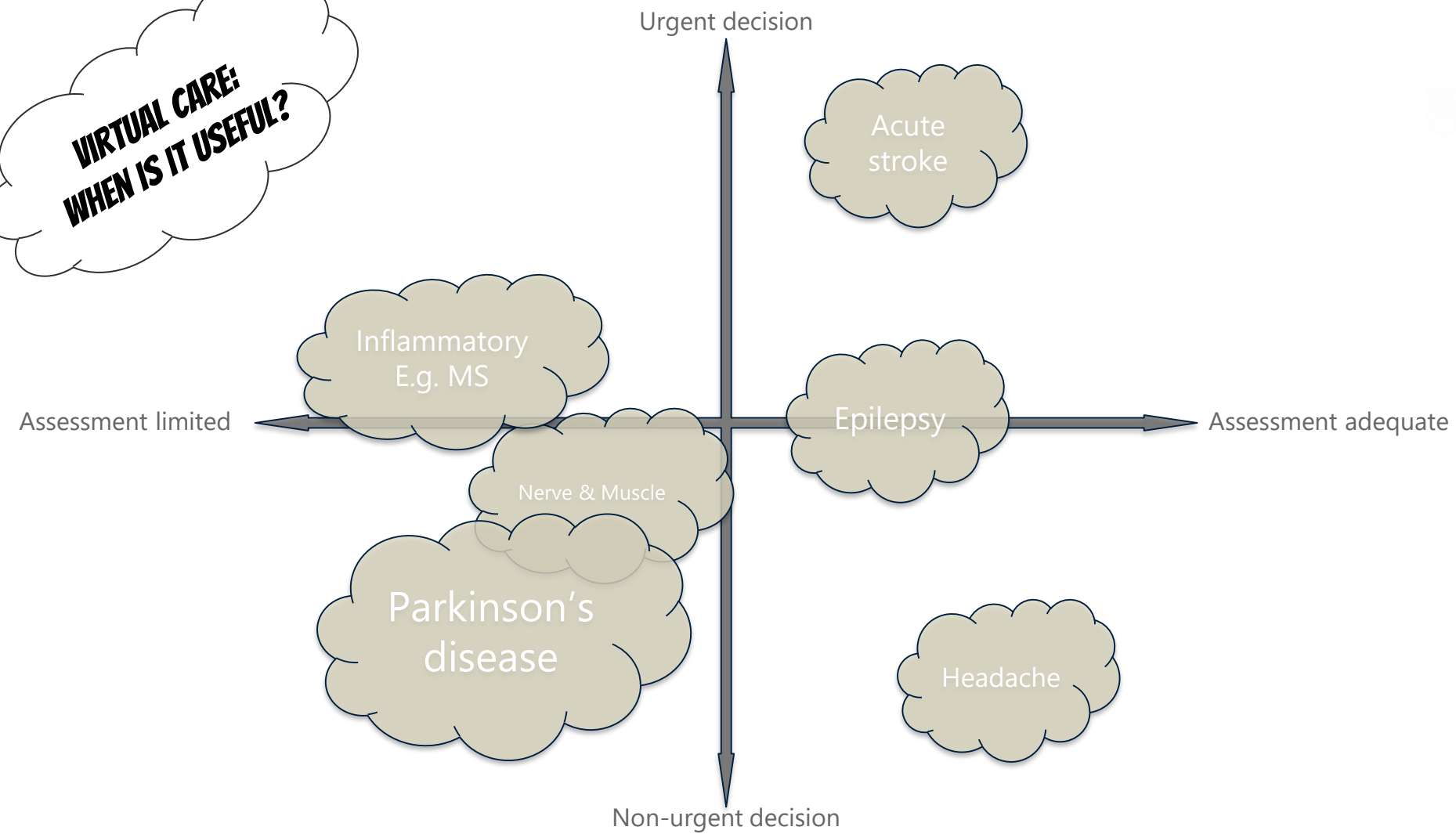
✓ **Tremor**

✓ **Slowness**

✓ **Dyskinesia**

✗ **Stiffness**


How do we take a 30-60 minute snapshot and guess what happens through the day?


VIRTUAL CARE:
WHEN IS IT USEFUL?
Urgent decision
Acute stroke
Inflammatory E.g. MS
Assessment limited
Epilepsy
Assessment adequate
Nerve & Muscle
Parkinson's disease
Headache
Non-urgent decision

TELESTROKE

Canadian Stroke Best Practices

Recommendations

Within Neurology:

Telemedicine is most widely used in acute stroke where
urgent treatment decisions require

a concise set of clinical data
and brain imaging

i. Telestroke networks should be implemented to provide access to stroke expert consultations for hyperacute and acute stroke assessment, diagnosis and treatment, including acute thrombolytic therapy with tissue plasminogen activator (tPA) and decision-making for endovascular therapy. [Evidence Level B]. *Refer to CSBPR Hyperacute Stroke Care module for additional information.*

v. Real-time two-way audiovisual communication should be in place to enable remote clinical assessment of the patient by the consulting stroke expert [Evidence Level B].

TELEMEDICINE IN HEADACHE

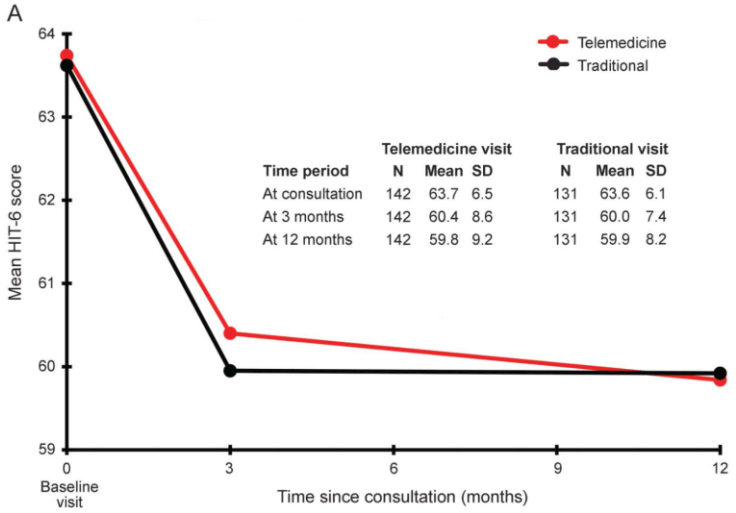
A randomized trial of telemedicine efficacy and safety for nonacute headaches

Kai I. Müller, MD
Karl B. Alstadhaug, MD, PhD
Svein I. Bekkelund, MD, PhD

Neurology® 2017;89:153-162

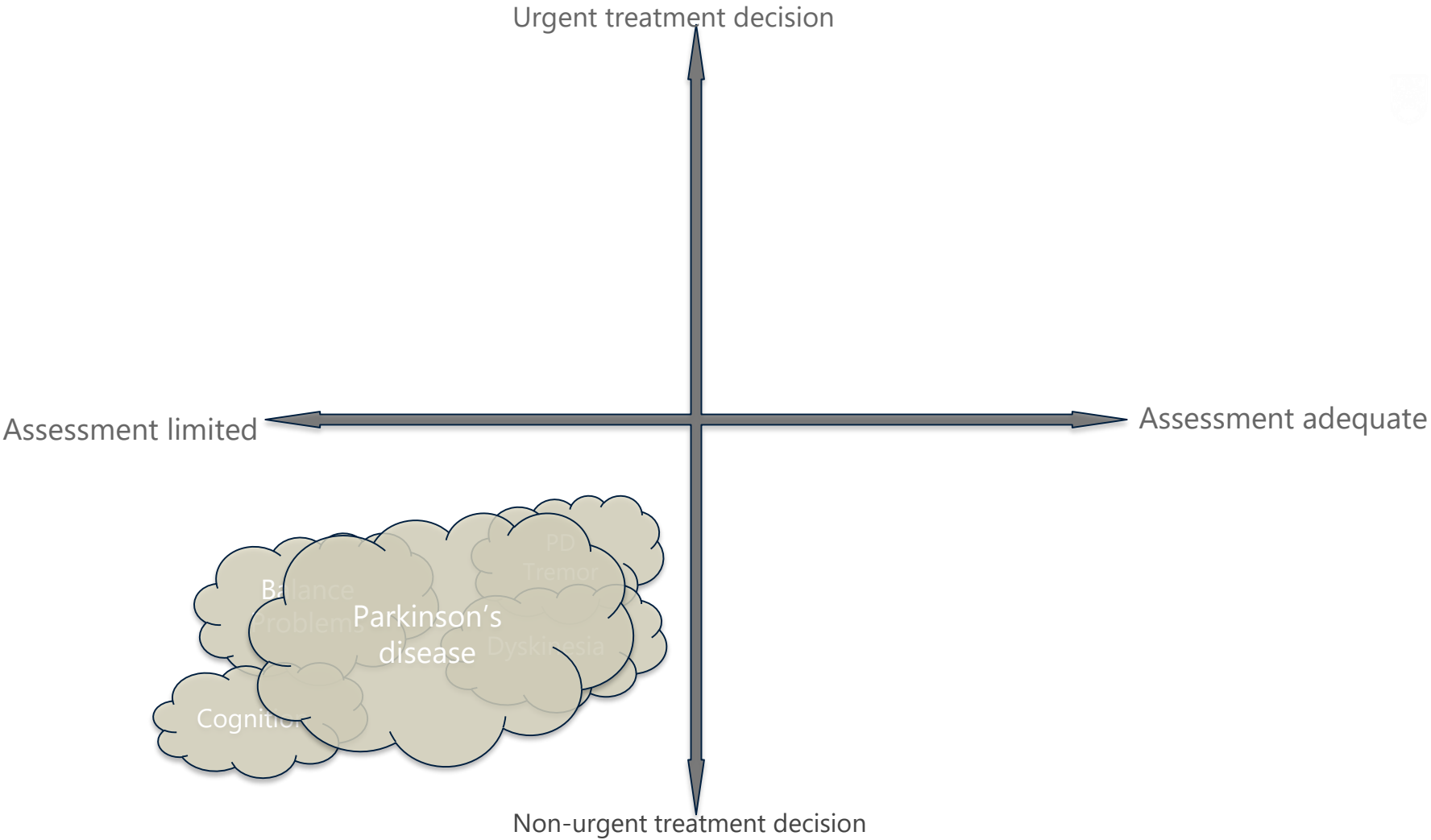
Conclusion: Telemedicine consultation for nonacute headache is as efficient and safe as a traditional consultation.

	All included patients		
	Telemedicine (n = 200)	Traditional (n = 202)	*p* Value
Female, n (%)	148 (74.0)	153 (75.7)	0.77
Age, y, mean (SD)	36.0 (13.0)	38.0 (13.7)	0.12



Time period	Telemedicine visit N	Mean	SD	Traditional visit N	Mean	SD
At consultation	142	63.7	6.5	131	63.6	6.1
At 3 months	142	60.4	8.6	131	60.0	7.4
At 12 months	142	59.8	9.2	131	59.9	8.2

Telemedicine might apply for new consultations in conditions where most of the key clinical information can be obtained from the history or by an examination assessed visually


Urgent treatment decision
Assessment limited
Assessment adequate
Parkinson's disease
Non-urgent treatment decision

TIMBRE / TEXTURE

STUDENT PROJECT

BRIEF COMMUNICATIONS

Perception of Healthcare Access and Utility of Telehealth Among Parkinson's Disease Patients

Dakota Peacock, Peter Baumeister, Alex Monaghan, Jodi Siever, Joshua Yoneda, Daryl Wile

ABSTRACT: Regional patient and physician density patterns pose problems to accessing care for people with Parkinson's disease, though telehealth may improve access. We surveyed and conducted a focus group for people with Parkinson's disease in Interior British Columbia regarding barriers to neurological care. Eighteen individuals completed the survey and seven parties joined the focus group. Perceived barriers include cost and difficulty of travel, wait times, and lack of specialized services outside large cities. 80% of participants (95% CI 64–96) would likely use telehealth for follow-up neurologist appointments. This sample of people with Parkinson's disease reports willingness to use telehealth to reduce travel and improve access to specialty care.

STUDENT PROJECT – DAKOTA PEACOCK

Perceived barriers to access

Do you avoid appointments at certain times of the year due to travel concerns?	Never	10 (40)
	Occasional, sometimes, or often	8 (32)
	Always	7 (28)

To get the best care for my PD, I need to live in a larger urban center	Disagree or strongly disagree	3 (12)
	Neither agree nor disagree	9 (36)
	Agree or strongly agree	13 (52)

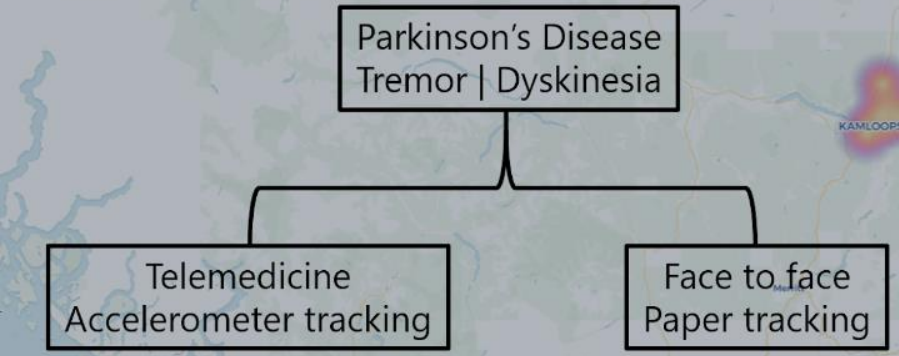
Impressions of telemedicine

I would be comfortable using videoconference technology for follow-up appointments with my neurologist	
Disagree or strongly disagree	1 (6)
Neither agree nor disagree	2 (12)
Agree or strongly agree	14 (82)

PARKINSMART

Parkinson's Disease Symptom Monitoring and Recording Technology

- How is health technology best applied to treatment planning in PD?



You can measure tremor or dyskinesia with

YOUR PHONE!

YOUR WATCH!

A RING?

Journal of Neuroscience Methods 230 (2014) 1–4

Contents lists available at ScienceDirect

Journal of Neuroscience Methods

journal homepage: www.elsevier.com/locate/jneumeth

Short communication

Smart watch accelerometry for analysis and diagnosis of tremor

Daryl J. Wile*, Ranjit Ranawaya, Zelma H.T. Kiss

Department of Clinical Neurosciences, Hotchkiss Brain Institute, University of Calgary, Canada

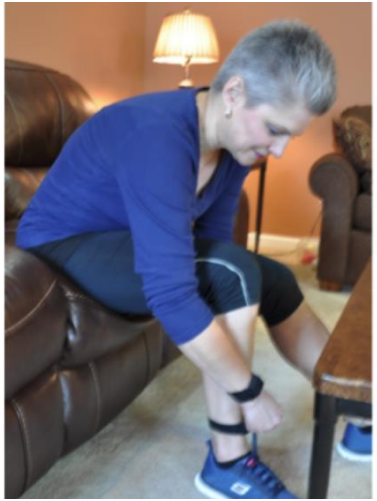
ARTICLE INFO

Article history:
Received 22 January 2014
Received in revised form 23 March 2014
Accepted 16 April 2014

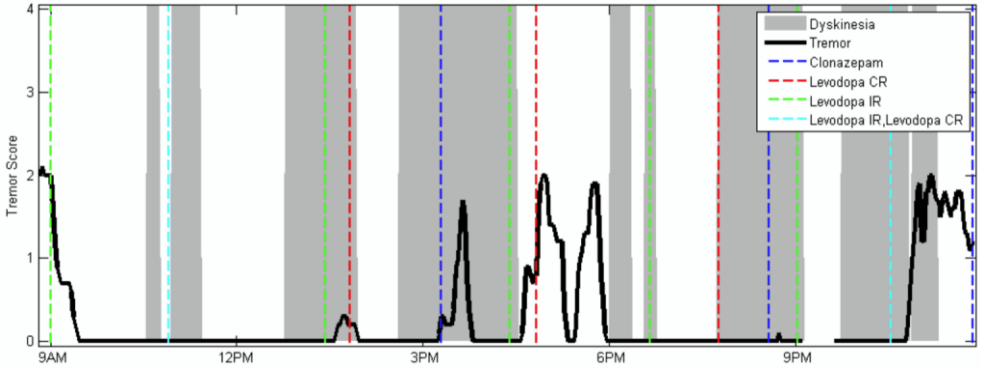
Keywords:
Tremor
Parkinson's disease
Essential tremor
Accelerometry

ABSTRACT

Background: Distinguishing the postural re-emergent tremor of Parkinson disease from essential tremor can be difficult clinically. Use of accelerometry to aid diagnosis is limited to laboratory settings. We sought to record and differentiate these tremors using a smart watch device in an outpatient clinic.
New method: 41 patients were enrolled. Recordings were made with a smart watch device on the predominantly affected hand (all patients), and simultaneously with an analog accelerometer (10 patients) with hands at rest and outstretched. Tremor peak frequency, peak power, and power of the first four harmonics was calculated and compared between the two devices. Mean power at the first four harmonics was calculated and used to classify tremor as parkinsonian or essential. Test characteristics were calculated to compare the device and clinical diagnoses.
Results: Mean harmonic peak power was both highly sensitive and specific for distinction of Parkinson disease postural tremor from essential tremor with an optimal threshold for our sample (sensitivity 90.9%, 95% CI 58.7–99.8%; specificity 100%, 95% CI 76.8–100%; Cohen's kappa = 0.91, SE = 0.08).
Comparison with existing methods: The smart watch and analog devices had nearly perfect concordance of peak frequency and proportional harmonic power. The smart watch recordings in clinic took 3–6 min.
Conclusions: A smart watch device can provide accurate and diagnostically relevant information about postural tremor. Its portability and ease of use could help translate such techniques into routine clinic use or to the community.

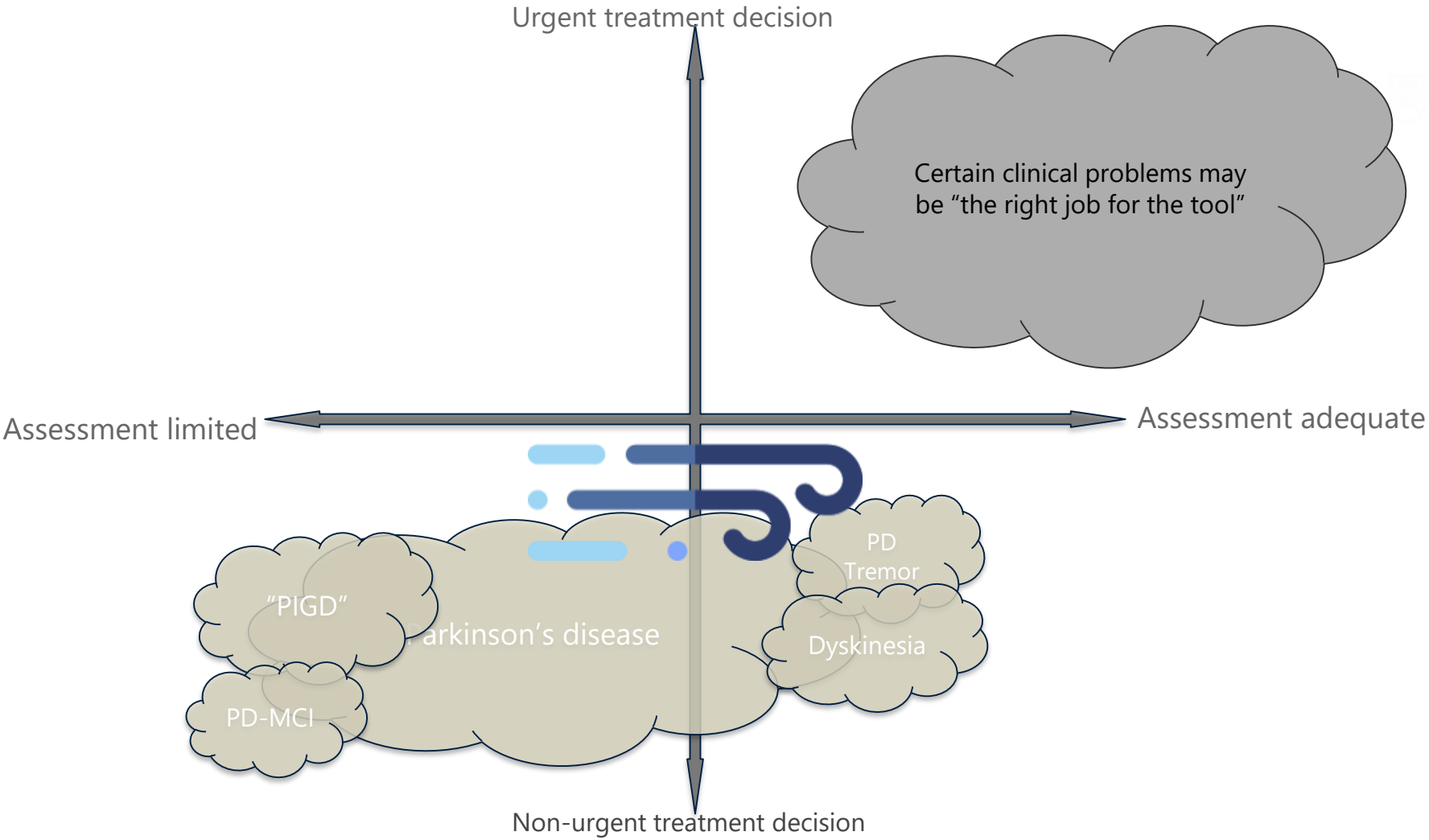


The user kit includes two sensor bands. One is worn on the wrist and one is worn on the ankle. Two sensor bands allow accurate and clinically validated assessment of Parkinson's motor symptoms. Sensor bands communicate with the app using Bluetooth.



Parkinson's Disease Symptom Diary

Parkinson's Symptoms	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 am	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	12 pm	1 am	2 am	3 am	4 am
Mobility																								
+3																								
+2																								
+1																								
0																								
-1																								
-2																								
-3																								
Tremor																								
0 No tremor																								
1 Mild																								
2 Mod-Severe																								
Dystonia																								
0 No dystonia																								
1 Mild																								
2 Mod-Severe																								
Medication taken																								


Urgent treatment decision
Certain clinical problems may be “the right job for the tool”
Assessment limited
Assessment adequate
PD Tremor
“PIGD”
Parkinson’s disease
Dyskinesia
PD-MCI
Non-urgent treatment decision

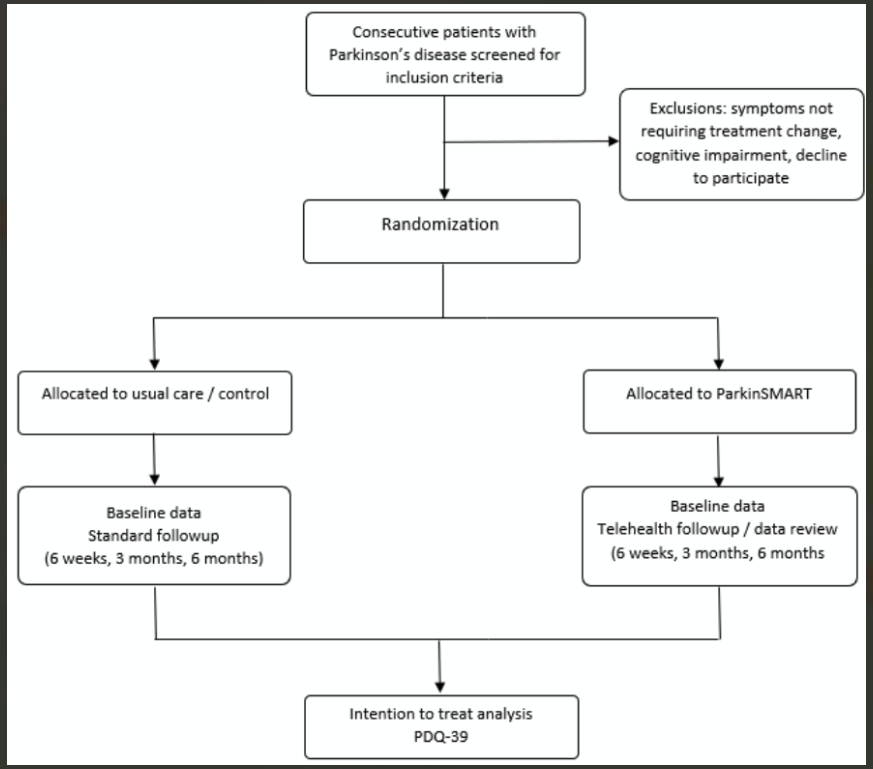
ParkinSMART

Parkinson's Disease Symptom Monitoring and Recording Technology

-Don't just use technology,
prove that it works
-Apply technology to the right problem
-When a treatment target is trackable,
track it!

PD Patients whose main treatment target at the time of the appointment is tremor or dyskinesia

Primary outcome: PDQ-39 quality of life measure at 6 months – noninferiority design



LOGISTICS

All patients present to the movement disorder clinic; those randomized to telemedicine care will conduct the appointment from another room on site

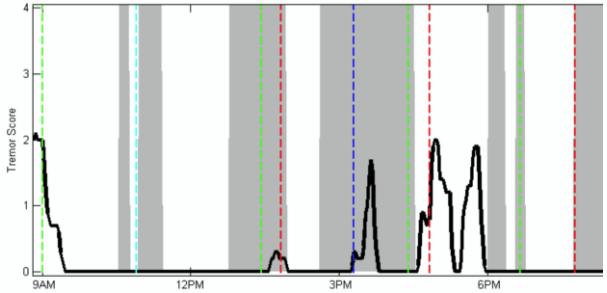
Avoids variables associated with reduced travel

Sensor data and telemedicine interview / exam

VS.

Symptom diaries and interview / exam in person

...to arrive at a treatment decision



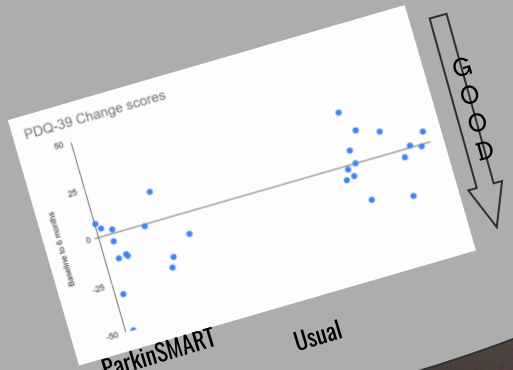
LO ICS

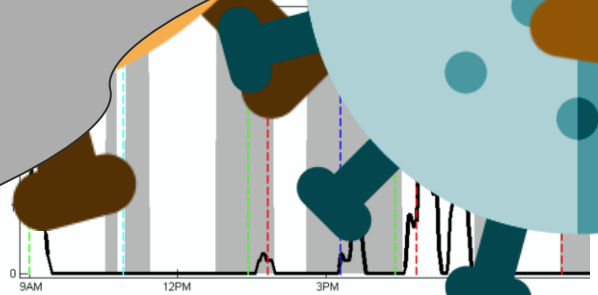
present movement disorder clinic; those randomized to conduct the appointment from another room on site

iated

ent

-EARLY STUDY TERMINATION
-INTENTION TO TREAT ANALYSIS
N=30





Response to COVID-19

Face-to-face appointments halted March - May 2020

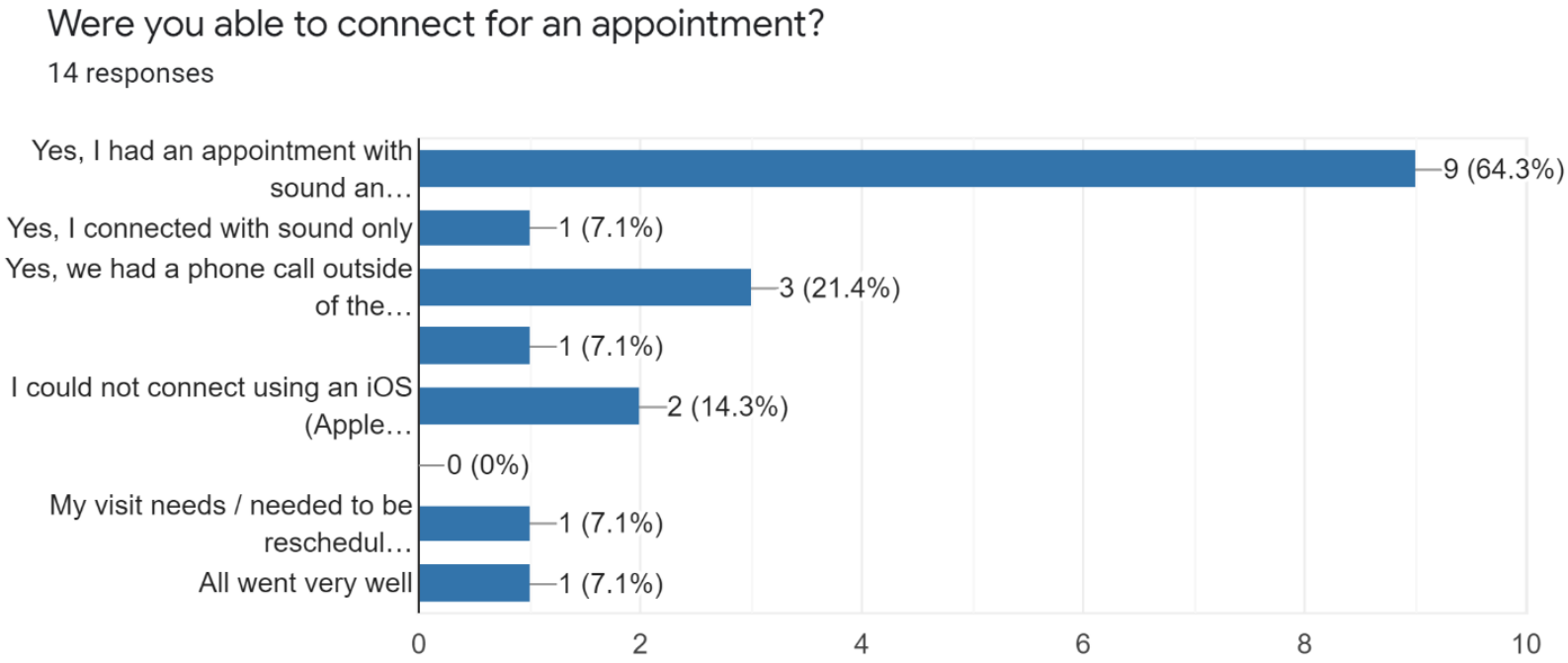
Major impact: dystonia and new consultations which can't be done virtually

Patient supports have been quick to respond

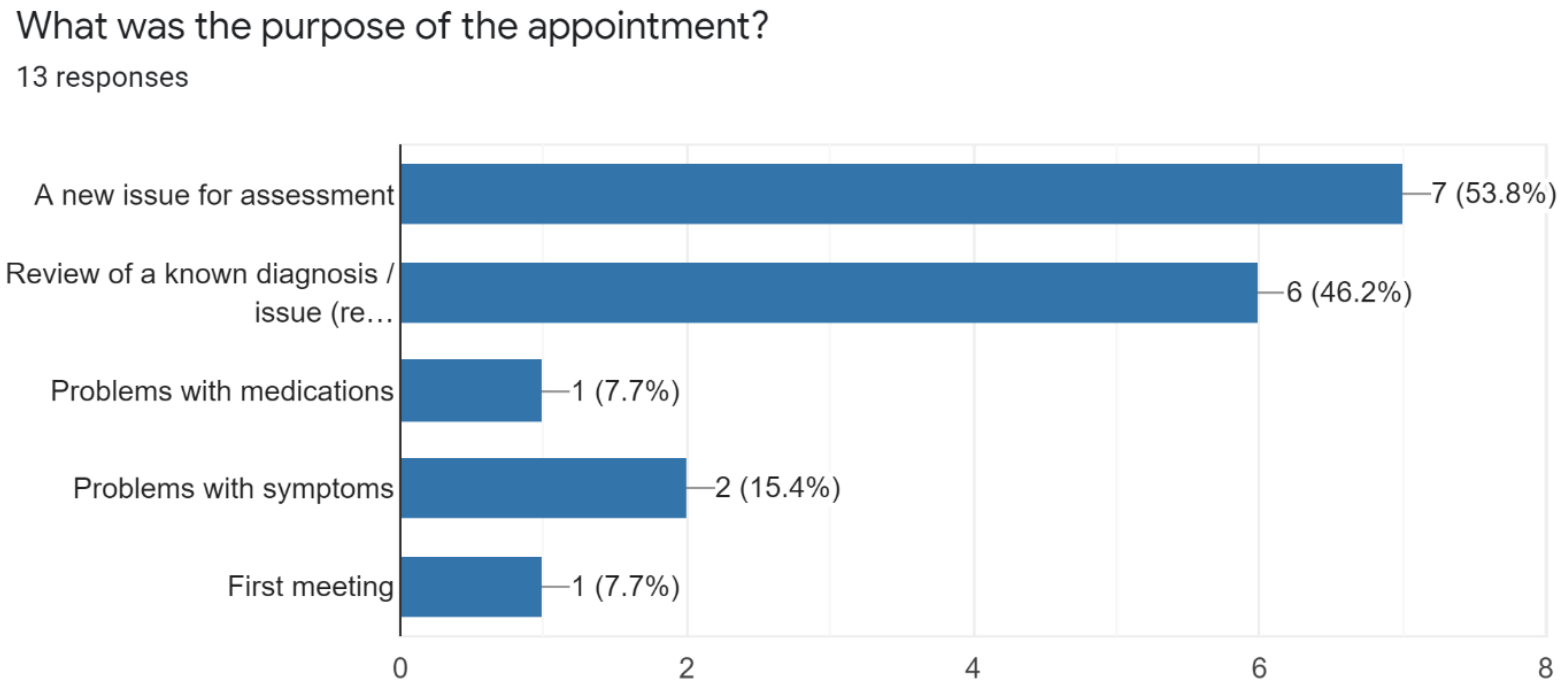
Doctors have widely continued with virtual care, phone calls

Health Authority support for virtual care tools (Zoom, doxy.me, …)
Hospital systems goals: limit problems requiring travel to the ER

Early Experience with Virtual Visits

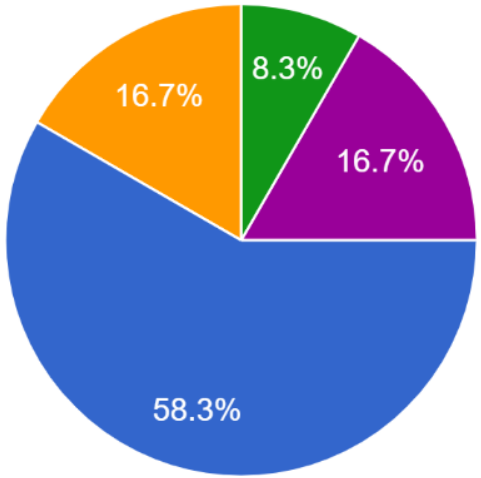


Early Experience with Virtual Visits



Were appropriate treatment / management plans made in the appointment?

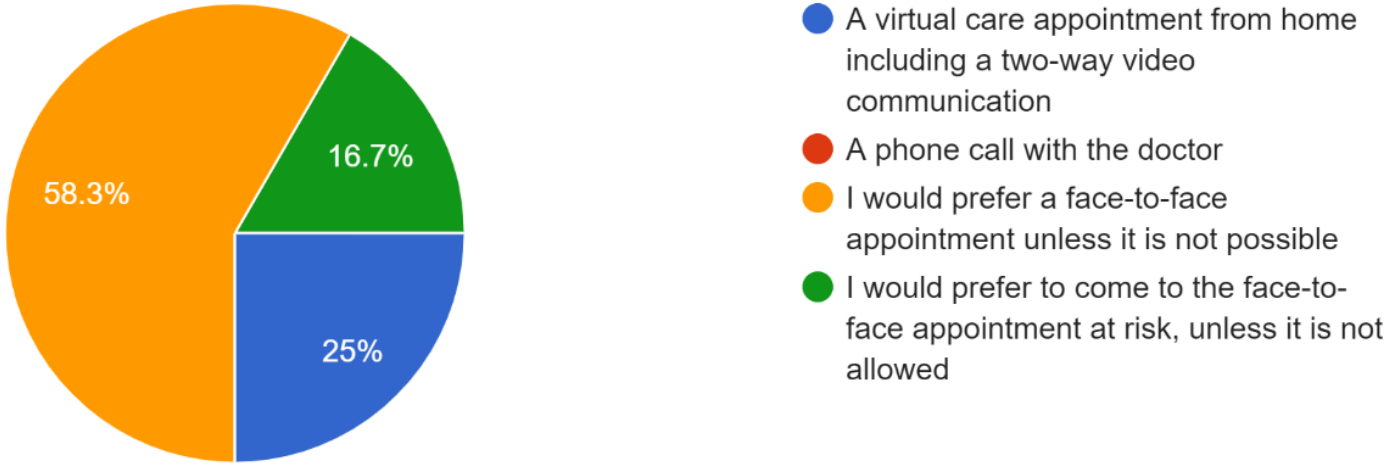
12 responses



- Yes, the appointment led to a clear plan
- No plans or changes were needed
- Decisions and plans were limited by the virtual visit
- Decisions and plans were limited by other aspects of the COVID-19 pandemic
- Appropriate plans were made

Which of the following would have been the best option for your assessment?

12 responses



- Appreciate the time and effort....given the ongoing COVID-19 situation
- this was a great for a follow up but I am glad to have seen you in person for the first visit
- the virtual whiteboard worked well
- Some restrictions for examining, but overall was good
- Had trouble getting sound so used phone as well
- better than a phone call
- privacy can be a concern
- What if an agenda (just a short list in point form) was displayed
- This worked good for me but our generation can be technically challenged, I have support in this area but all seniors do not.

A FEW MONTHS LATER...

- Business conferencing tools may have some use for medical care
- Bandwidth and connection issues are common
- Camera quality / position is important and often limited
- Administrative support and training is critical
- Things that might not work "virtual" almost always need another "some time" appointment

Patient portal for gathering info

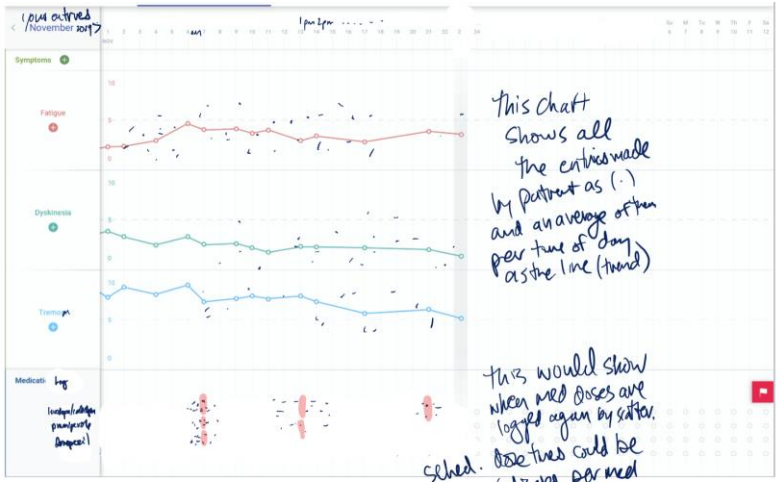
Must be flexible for different specialties/problems

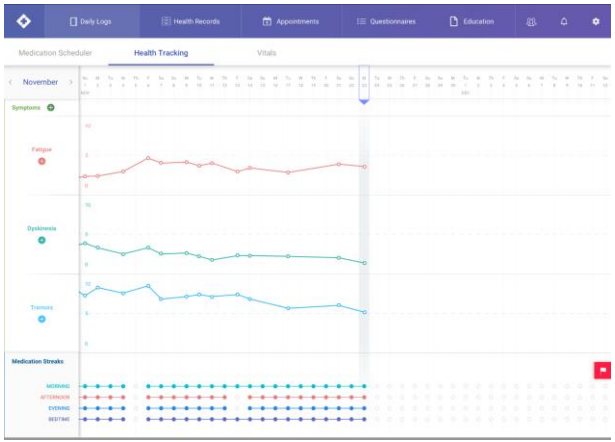
In PD:

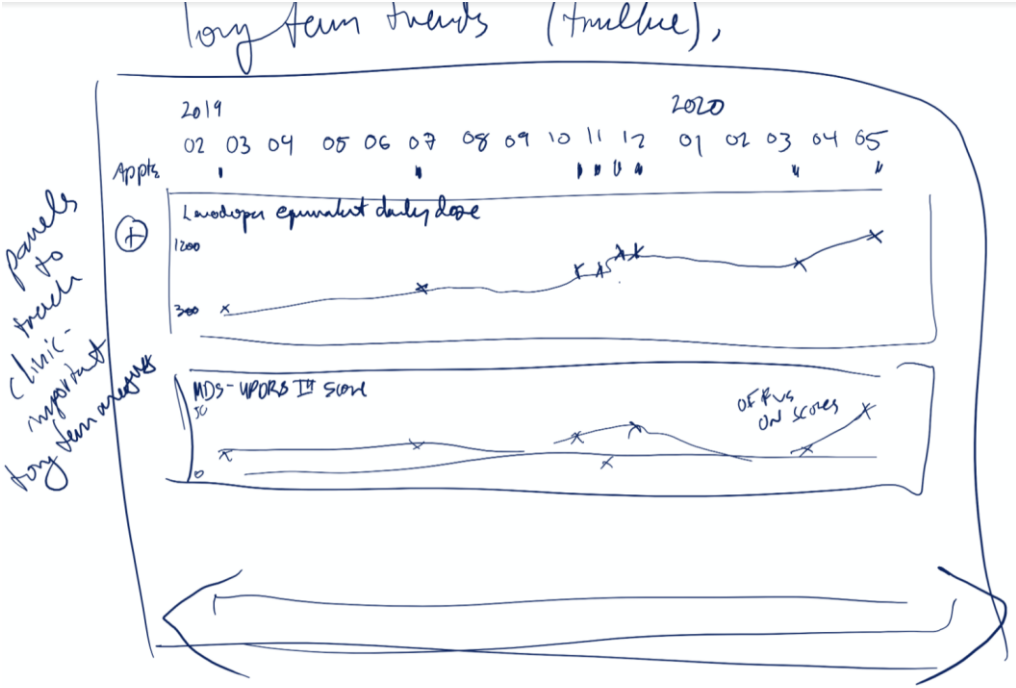
-Symptom diary

-Medication diary

-Standardized tests


Symptoms
Fatigue
Dyskinesia
Tremor
Medicati
This chart shows all the entries made by patient as (·) and an average often per time of day as the line (trend)
This would show when med doses are logged again by setter. Dose times could be indicated per med with symptoms
sched.


Daily Logs
Health Records
Appointments
Questionnaires
Education
Medication Scheduler
Health Tracking
Vitals
November
Symptoms
Fatigue
Dyskinesia
Tremors
Medication Streaks
MORNING
AFTERNOON
EVENING
BEDTIME


long term trends (timeline),
2019
2020
02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05
Appts
Levodopa equivalent daily dose
1200
300
MDS-UPDRS III score
OFF vs ON scores
panels to track clinic-important long term measures

THANK YOU