Is the Physiotherapist of the Future Advanced?

A short Symposium on Advanced Practice Physiotherapy (APP) in Emergency Departments and Orthopedic Clinics

Advanced practice physiotherapy care in emergency departments for patients with musculoskeletal disorders: Preliminary results of a pragmatic randomized controlled trial and cost analysis

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Université de Montréal et du monde.

Background

Overcrowding in emergency departments (EDs) worldwide;

- Will worsen with aging populations, physician shortages.

Canada is among the countries with the longest ED waiting times.

Musculoskeletal disorders (MSKD) represent at least 25% of ED visits;

- MSKD affect 11 million Canadians per year.

Traditionally, ED physicians are the first-contact practitioners who manage patients with MSKD;

- Limited knowledge and confidence in MSKD care.

Background

New collaborative models of care including physiotherapists in advanced practice roles to help relieve physicians' burden

- Dx and triage
- Ordering medical imaging or prescribing or recommend medications.

Advanced practice physiotherapy (APP) can improve outcomes for patients with MSKD as well as improve resources use in health care systems.

APP models of care are emerging worldwide

- More evidence is needed
- Large high quality, pragmatic RCTs are needed

Matifat *et al. Trials* (2023) 24:84
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Trials

STUDY PROTOCOL Open Access

Advanced practice physiotherapy care in emergency departments for patients with musculoskeletal disorders: a pragmatic cluster randomized controlled trial and cost analysis

E. Matifat[1], E. Berger Pelletier[2], R. Brison[3], L. J. Hébert[4,5], J.-S. Roy[4,5], L. Woodhouse[6], S. Berthelot[7], R. Daoust[7], M.-J. Sirois[5], R. Booth[8], R. Gagnon[4,5], J. Miller[8], Y. Tousignant-Laflamme[9], M. Emond[7], K. Perreault[4,5] and F. Desmeules[1,10*]

Full article in preparation to be submitted

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Objectives

To evaluate the impact of an APP-led model of care compared to usual physician ED care for patients with a minor MSKD.

Specific objectives:

1. Compare effectiveness of care in terms of patients-related outcomes;
2. Compare healthcare resource utilization;
3. Compare wait times and ED lenght of stay.
4. Compares direct costs and perform a cost-utility analysis

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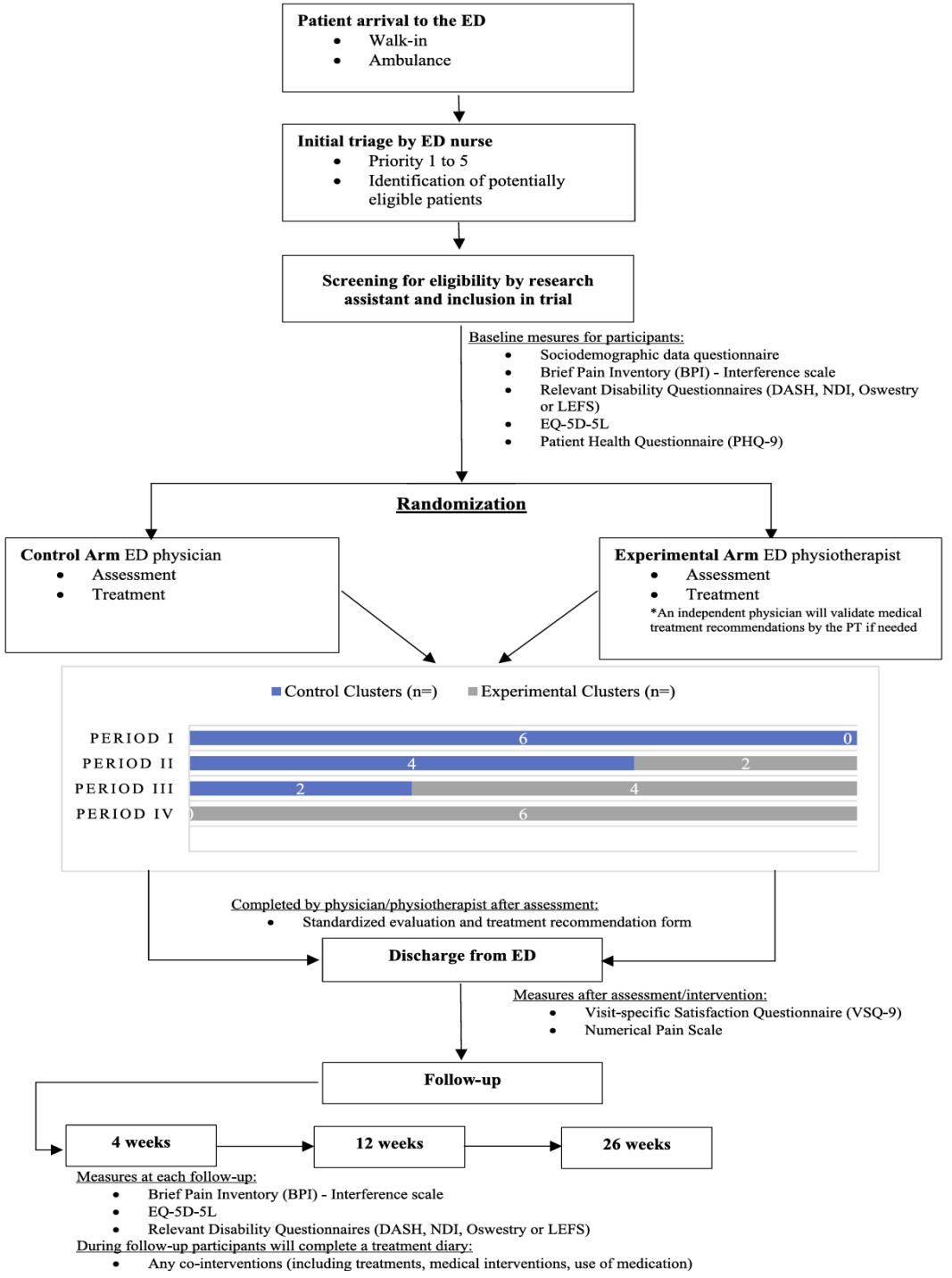
Methods

- Stepped wedge pragmatic multicenter trial
- 6 Canadian EDs
- 12 APP trained physiotherapists
- Participants were not blinded



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STUDY PROTOCOL Open Access

Methods

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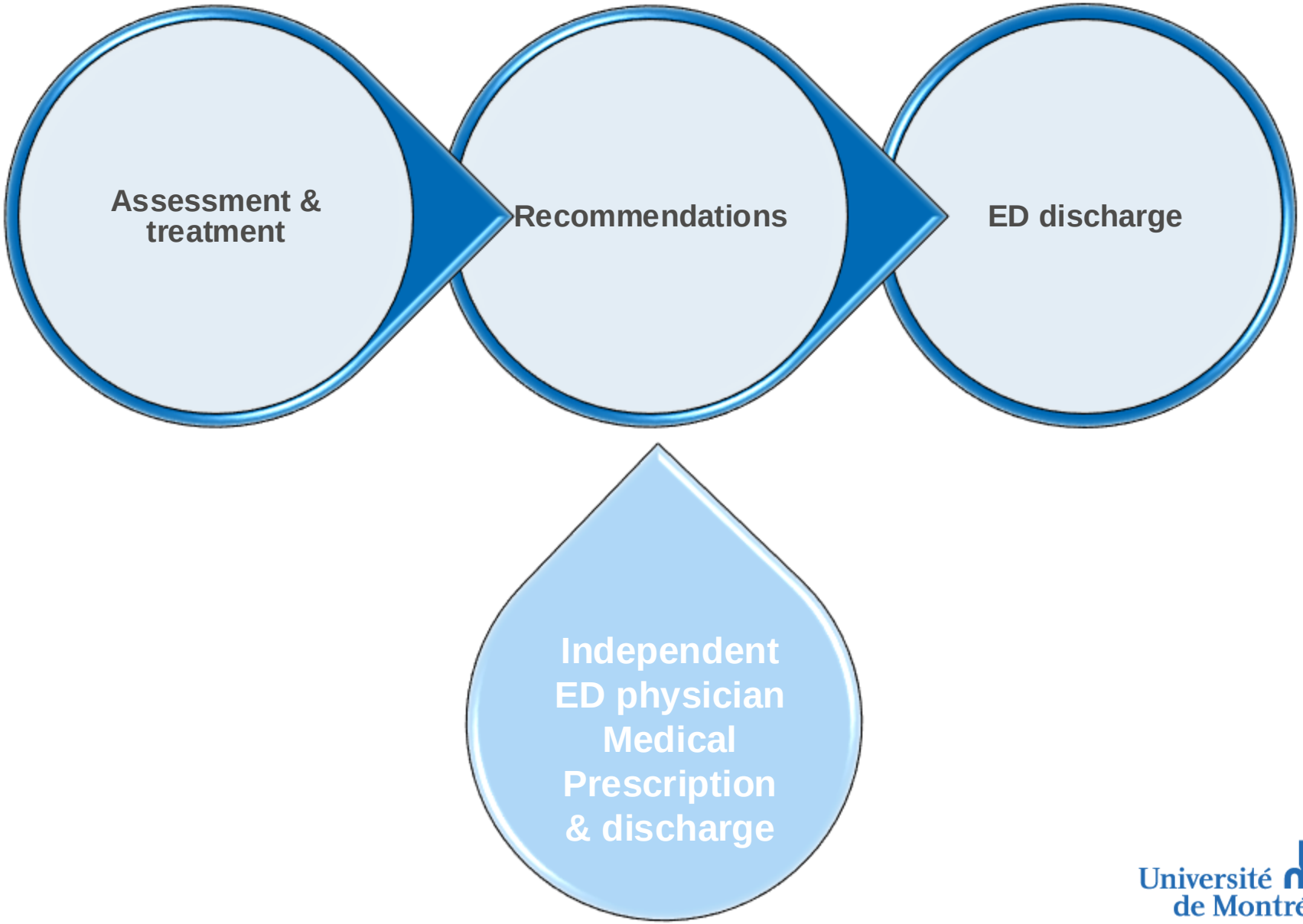
Inclusion criteria:

- ✓ Adults with MSKD
- ✓ Level 3, 4 or 5 on the Canadian Triage and Acuity Scale

Exclusion criteria:

- χ Significant trauma or major MSKD or injury,
- χ Red flags,
- χ Patients with diagnosed inflammatory arthritis,
- χ Active/unstable non-MSKD conditions,
- χ Work-related MSKD eligible for workers' compensation benefits.

APP model of care



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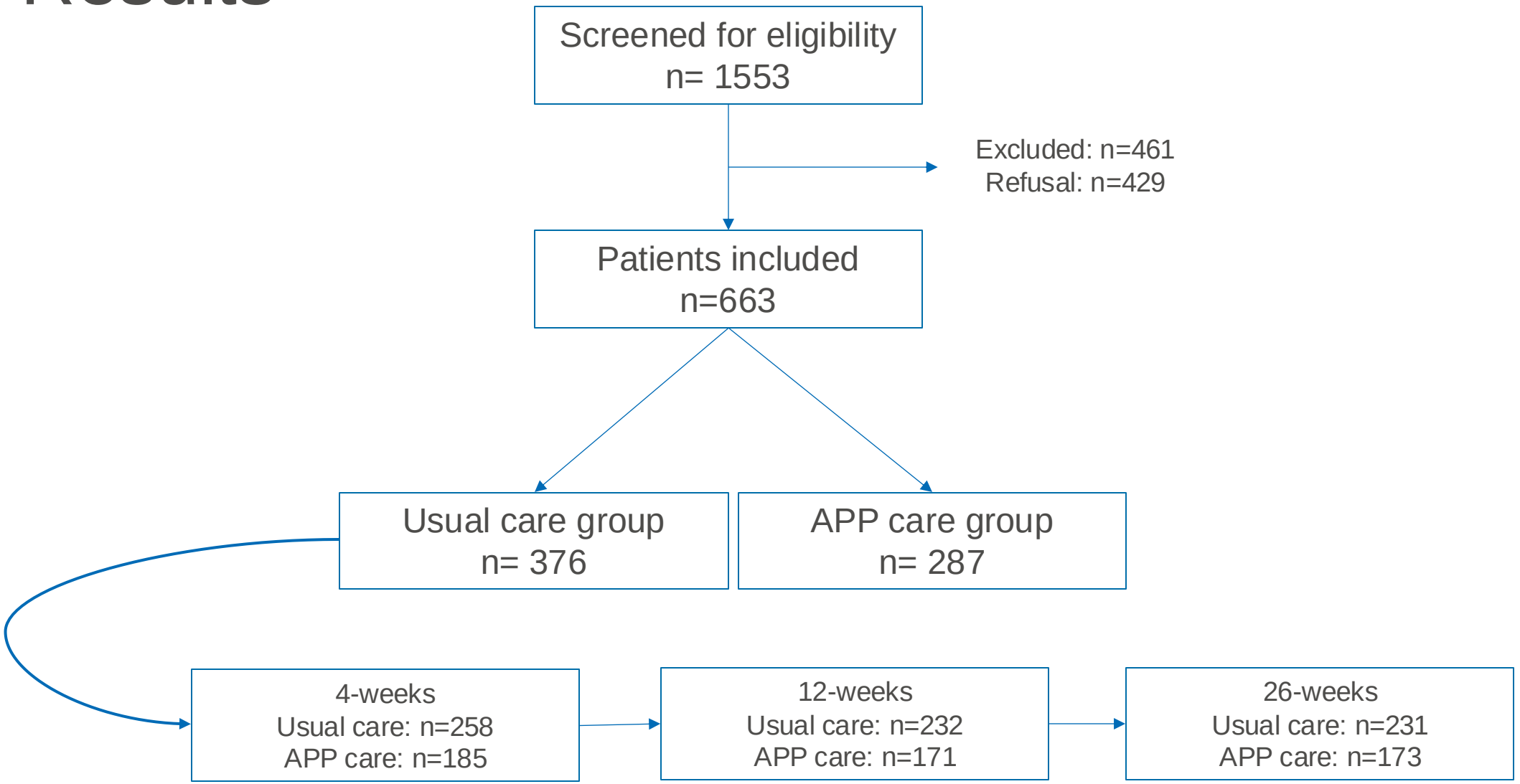
Results


Screened for eligibility
n= 1553
Excluded: n=461
Refusal: n=429
Patients included
n=663
Usual care group
n= 376
APP care group
n= 287
4-weeks
Usual care: n=258
APP care: n=185
12-weeks
Usual care: n=232
APP care: n=171
26-weeks
Usual care: n=231
APP care: n=173

Results

APP: 49.8% female

Usual: 55.3% female

APP: 44.7 years ± 17.9

Usual: 46.5 years ± 19.4

College or University

Usual: 62.8%

APP: 57.1%

CTAS

Usual: P3: 23.4%, P4: 47.9%, P5: 29.0%

APP: P3: 36.9%, P4: 36.2%, P5: 26.8%

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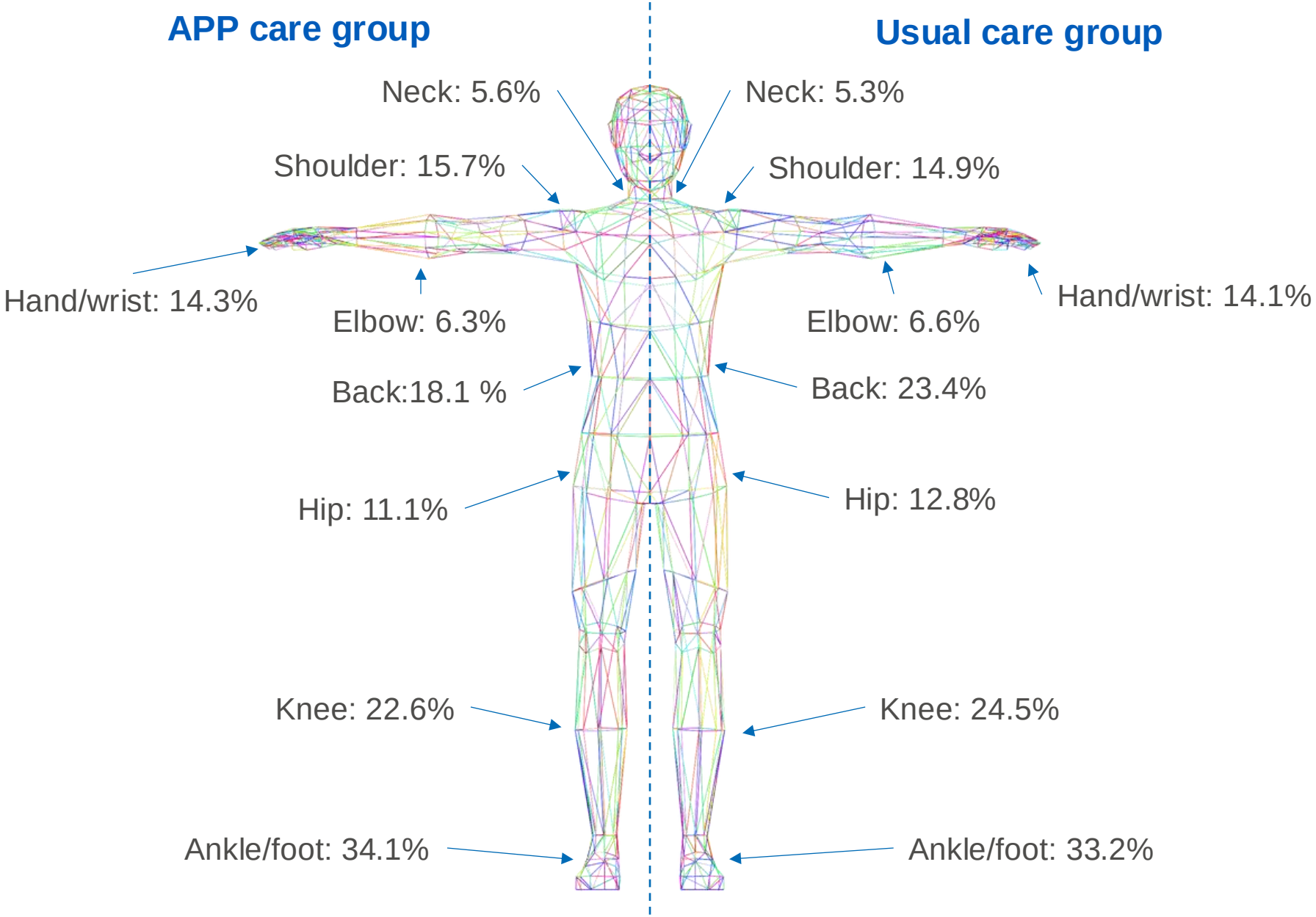
Results

Ankle & Foot
Knee
Low Back
Shoulder



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Results – ED Care provided

	Usual care group n=376	APP care group n=287	Chi-square	P value
Medical imaging prescribed				
X-Ray	243 (64.6)	186 (64.8)	0.002	0.962
CT-scan	20 (5.3)	10 (3.5)	1.268	0.260
MRI	6 (1.6)	7 (2.4)	0.602	0.438
Ultrasound	11 (2.9)	10 (3.5)	0.166	0.684
Medication prescribed				
Analgesics	122 (32.4)	92 (32.1)	0.011	0.915
NSAIDs	126 (33.5)	88 (30.7)	0.604	0.437
Opioids	52 (13.8)	39 (13.6)	0.008	0.929
Muscle relaxants	21 (5.6)	11 (3.8)	1.088	0.297
Referral to other medical or health professionals within ED	14 (3.7)	15 (5.2)	0.879	0.348
Discharge plan				
Discharge home	371 (98.7)	279 (97.2)	1.799	0.180
Hospitalization	5 (1.3)	8 (2.8)		

Results – Care provided in the ED

	Usual care group[a] n=376	APP care group n=287	Chi square	P value
Advice and education	256 (68.27)	269 (93.73)	64.22	**<0.001**
Walking aids and orthosis	95 (25.33)	90 (31.36)	2.93	0.087
Supervised outpatient physiotherapy	92 (24.53)	158 (55.05)	64.43	**<0.001**
Home exercises	27 (7.20)	125 (43.55)	121.47	**<0.001**

[a]*Missing data: 1*

Results – Initial ED visit

	Mean	Median (Quartiles)	P-value
Wait times (minutes)			
Usual care group [a]	188.97	133 (80-249)	**<0.01**
APP care group	116.52	96 (65-148)	
Length of stay in the ED (minutes)			
Usual care group [b]	295.26	241.5 (157-375.75)	0.20
APP care group	277.99	217 (163-310.5)	

[a]*Missing data: 1*

[b]*Missing data:2*

	Group	Mean (±SD)	Median (Quartiles)	p value
Modified VSQ-9 (0-100)	Usual care[a]	71.9 (23.98)	75 (54.2 – 92.9)	**<0.001**
	APP care[b]	90.5 (14.56)	100 (85.7-100)	

[a]*Missing data: 27*

[b]*Missing data: 13*

Results – Primary Outcome BPI-I and BPI-S

		Usual care group				APP care group				Between-group difference	
		n	Mean	SD	95%CI	n	Mean	SD	95%CI	Mean (95%CI)	p value
BPI-I	**Baseline**	376	5.47	2.36	5.23 – 5.71	287	5.82	2.35	5.55 – 6.10		
(0-10)	**4 weeks**	257	2.67	2.62	2.35 – 2.99	185	2.64	2.44	2.29 – 2.99	-0.44 (-0.93 to 0.05)	**0.029**
	12 weeks	231	2.02	2.52	1.69 – 2.34	171	1.79	2.32	1.44 – 2.14	-0.66 (-1.16 to -0.15)	
	26 weeks	232	1.56	2.50	1.23 – 1.88	172	1.30	2.15	0.98 – 1.62	-0.62 (-1.12 to -0.11)	
BPI-S	**Baseline**	376	5.34	2.12	5.12 – 5.55	286	5.41	2.16	5.16 – 5.66		
(0-10)	**4 weeks**	256	2.31	2.20	2.04 – 2.58	182	2.31	2.18	1.99 – 2.63	-0.10 (-0.52 to 0.32)	
	12 weeks	229	1.97	2.37	1.66 – 2.28	171	1.70	2.03	1.39 – 2.00	-0.48 (-0.91 to -0.05)	0.149
	26 weeks	232	1.61	2.30	1.31 – 1.90	172	1.43	1.98	1.14 – 1.73	-0.28 (-0.71 to 0.15)	

Negative values for the BPI-I, BPI-S are in favor of the APP group

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Results – Secondary Disability Outcomes

		Usual care group				APP care group				Between-group difference	
		n	Mean	SD	95%CI	n	Mean	SD	95%CI	Mean (95%CI)	p value
ODI	**Baseline**	88	47.72	19.16	43.72 – 51.73	52	46.81	20.18	41.32 – 52.29		
(0-100)	**4 weeks**	48	27.19	22.06	20.95 – 33.43	34	24.59	10.18	17.81 – 31.38	0.31 (-8.08 to 8.71)	
	12 weeks	41	20.91	19.10	15.06 – 26.76	37	18.71	19.84	12.32 – 25.10	-0.63 (-9.24 to 7.98)	0.981
	26 weeks	48	19.83	21.13	13.85 – 25.81	32	14.19	17.26	8.21 – 20.17	-1.51 (-10.06 to 7.04)	
NDI	**Baseline**	20	40.36	19.88	31.64 – 49.07	15	41.87	17.21	33.16 – 50.58		
(0-100)	**4 weeks**	13	16.82	15.96	8.14 – 25.50	6	48.67	22.76	30.46 – 66.88	28.21 (8.47 to 47.94)	
	12 weeks	13	22.92	19.50	12.32 – 33.53	8	29.75	25.80	11.87 – 47.63	9.52 (-8.68 to 27.72)	0.051
	26 weeks	11	29.45	26.46	13.82 – 45.09	7	22.00	22.66	5.22 – 38.78	2.30 (-18.15 to 22.75)	
LEFS	**Baseline**	218	30.54	20.66	27.80 – 33.29	165	29.15	19.83	26.13 – 32.18		
(100-0)	**4 weeks**	155	59.18	27.38	54.87 – 63.49	100	60.06	27.91	54.59 – 65.53	2.39 (-4.41 to 9.19)	
	12 weeks	136	73.42	27.89	68.73 – 78.11	93	74.17	23.25	69.44 – 78.89	2.62 (-4.41 to 9.65)	0.694
	26 weeks	133	78.31	27.83	73.58 – 83.04	98	76.06	28.78	70.36 – 81.76	-1.27 (-8.25 to 5.72)	
Quick-DASH	**Baseline**	109	55.96	23.86	51.48 – 60.44	91	58.09	21.60	53.66 – 62.53		
(0-100)	**4 weeks**	69	30.70	24.15	25.00 – 36.40	59	32.63	22.09	26.99 -38.26	-0.66 (-8.01 to 6.69)	
	12 weeks	61	22.54	23.29	16.70 – 28.38	50	18.05	18.25	12.99 – 23.10	-7.34 (-15.17 to 0.48)	0.228
	26 weeks	63	13.85	19.66	9.00 – 18.71	49	10.85	14.26	6.86 – 14.85	-4.96 (-12.76 to 2.85)	

Negative values for the ODI, NDI and Quick-DASH are in favor of the APP group. Positive values for the LEFS are in favor of the APP group.

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Results – Outcomes

		Usual care group				APP care group				Between-group difference	
		n	Mean	SD	95%CI	n	Mean	SD	95%CI	Mean (95%CI)	p value
EQ-5D-5L	**Baseline**	375	0.47	0.25	0.44 – 0.49	286	0.48	0.24	0.45 – 0.50		
(1-0)	**4 weeks**	250	0.76	0.20	0.73 – 0.78	181	0.76	0.18	0.74 – 0.79	-0.01 (-0.05 to 0.03)	
	12 weeks	225	0.82	0.17	0.80 – 0.84	168	0.83	0.15	0.81 – 0.85	0 (-0.04 to 0.05)	0.953
	26 weeks	226	0.83	0.18	0.81 – 0.86	171	0.85	0.15	0.83 – 0.87	0 (-0.04 to 0.05)	
EQ-VAS	**Baseline**	369	61.69	23.19	59.33 – 64.06	274	59.90	23.49	57.12 – 62.68		
(100-0)	**4 weeks**	245	70.44	21.64	67.73 – 73.15	168	72.33	18.76	69.49 – 75.16	3.35 (-0.99 to 7.69)	
	12 weeks	223	76.77	20.72	74.05 – 79.49	155	76.15	18.81	73.19 – 79.11	1.63 (-2.85 to 6.12)	0.400
	26 weeks	221	80.38	18.83	77.90 -82.87	163	78.49	19.70	75.47 – 81.52	-0.19 (-4.63 to 4.25)	
NPS	**Before**	349	52.38	25.19	49.74 – 55.03	280	56.49	23.37	53.75 – 59.23	4.11 (0.26 to 7.95)	0.036
(0-100)	**discharge**										

Positive values for the EQ-5D-5L and EQ-VAS are in favor of the APP group.

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Results – Adverse events (6 cases)

- Imaging: 2 cases where physicians wanted imaging
  - No missed Fx

- Medication: APPT recommended NSAIDs, but not advised due to hypertension.

- Discharge: APPT recommended discharge, but patient was seen by orthopaedics and then discharged.

- Discharge: APPT recommended discharge, but patient was admitted to internal medicine.

- Discharge: skin abrasions that needed cleaning before discharge.

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Patients' experience - Qualitative analysis (n=11)

Patients had a positive care experience and are highly satisfied with the care received

- "The physiotherapist was really good, she really listened to my problem."
- "I believe it's one of the times I don't have anything to say about my visit to the emergency room."

Patients perceived PPAs as competent first-contact healthcare providers in the emergency department.

- "They give great advices, perhaps even better ones than a physician who sees a bit of everything."
- "Even if it's responsabilities that physiotherapist didn't have before, […] they can manage all that. […] A great progress for Quebec."

Patients are in favor of the implementation of this new model of care and find it beneficial.

- "(…) it can somehow reduce physician's workload and maybe reduce waiting times in the emergency room. "
- "(…) medication, I'd prefer to have it prescribed by a physician, or […] that the physiotherapist suggestion be validated by a pyshician."

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RESEARCH ARTICLE

WILEY

Patients presenting with musculoskeletal disorders in the emergency department: A qualitative study of their experiences when cared by advanced practice physiotherapists in the province of Québec

Juliette Blondin[1,2] | François Desmeules[1,2] | Eveline Matifat[1,2] | Amélie Kechichian[1,3]

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Discussion

The APP model in the ED demonstrates benefits

- Clinical outcomes
  - No differences at 4 weeks
  - Small potentially clinical important differences at 3 and 6 months
- Higher patient satisfaction
- Reduced wait times
- Resource utilization comparable at the initial visit
  - Systematic medical directives sometimes applied for both arms

Discussion

Protocol deviation

ED Physicians modified APP care plan related to personal preferences (60% of cases imaging was added or medication modified)

Follow-up lower than expected (68% at 6 months)

Trial took place during the COVID crisis

Full resource usage and cost-analysis underway

- TDABC direct cost evaluation
- Cost-utility comparison (QALY with EQ5D)

Trial registration

ClinicalTrials.govNCT05545917. Registered on September 19, 2022.

Funding

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Canadian Institutes of Health Research

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