

Assessment of general practitioners' interests in expediting wait lists for spine surgical consultation with use of allied health professionals—results of a pilot study

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Background: General practitioners' (GPs) opinions of non-physician clinician (NPC)-led triaging programs to expedite surgical consultation wait lists for patients presenting with non-urgent lower back pain (LBP) are not well described. Therefore, we targeted GPs practicing in Hamilton, Ontario and assessed their current experiences with referral to a single, large-scale spine surgery service as well as their feelings towards the implementation of triaging programs to improve the provision of health care.

Methods: A 21-item cross-sectional web-based questionnaire was disseminated to 281 active GPs referring to a single high-volume academic spine surgery centre. Likert-style questions assessed respondents' current non-urgent LBP referral practices and experiences, as well as their receptiveness to a NPC-led triaging program. Descriptive data, which comprised the entire data set, were reported as counts and percentages.

Results: Among the 57 respondents (20% response rate; 57/281), there was an overwhelming dissatisfaction with current wait times for spine surgery consultation (91%; 52/57) despite referral practices being conservative with respect to the clinical indices that warrant diagnostic imaging and subsequent consultation. Ultimately, GPs strongly supported NPC-led LBP triage programs, feeling most comfortable with initiatives that are spearheaded by advance-practice physiotherapists (96%; 50/52). Finally, most respondents were interested in learning how to integrate triaging techniques into their own practice (81%; 42/52) to further expedite LBP patient assessments.

Conclusions: GPs expressed a strong support for LBP triage programs run by NPCs. Future investigation is needed to assess the cost-effectiveness, feasibility, and patient satisfaction of such an initiative.

Keywords: Spinal surgery; lower back pain (LBP); primary care; triage

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Introduction

Spine surgeon consultation for patients with non-urgent low back pain (LBP) is among the longest wait-times for any medical service in Canada (1). Braybrooke *et al.* have estimated a 1–2 year waiting period between one's primary care visit and subsequent spine surgical consultation for non-urgent LBP in Canada (2). Given that many individuals with non-urgent LBP do not need surgical intervention (3), prolonged physical and emotional stress as a consequence of excessive wait times can be avoided. Beyond the individual level, there is evidence that LBP also manifests as an immense economic burden in the United States and in Canada (4–6). This fact, compounded with an ever-increasing mean population age, underscores the importance of anticipating the forthcoming obstacles faced by all parties involved in the management of LBP (1,4).

It is clear that the Canadian research community is largely aware and concerned about the inaccessibility of spine surgeon consultations for cases of LBP (2,3,7). General Practitioners (GPs) are consistently regarded as a source of insight, since these professionals are often entrusted by patients with LBP to make initial decisions on one's course of treatment (3,8,9). Oftentimes, however, these decisions lead to inappropriate surgical referrals, as Deis and Findlay have previously estimated the rate of inappropriate LBP referrals for surgical consultation to exceed 40% (9). Findings from a survey administered by Busse *et al.* to fifty-five spine surgeons adds to the complexity of this process, as 78% of respondents require imaging to accompany all referrals (10). This is in contrast to evidence which discourages GPs from routine, immediate lumbar imaging (11), therefore placing GPs in a state of limbo and uncertainty. Such a discrepancy is likely to augment the already excessive wait times for spine surgeon consultation in Canada, which has been shown to predict worse post-operative outcomes for those needing surgical intervention (2,12).

Spine triage programs in which allied health professionals are trained by surgeons to assess patients with LBP has been widely accepted by the academic community (1,10,13–17). Triage would, in theory, improve the quality and accessibility of care for patients with LBP by offering evidenced-based screening and non-operative treatment prior to surgery (18). The Saskatchewan Spine Pathway is a testament to this notion, as researchers demonstrated that a unified and multidisciplinary approach to LBP management can reduce unnecessary MRI utilization and surgical referrals (13,14).

Non-physician clinicians (NPCs), such as physiotherapists (PTs), nurse practitioners, and physician assistants, who train alongside spine surgeons have a proven ability to spearhead such an initiative (15,16,19–21).

Thus, our primary objective was to assess general practitioner's (GPs) experiences with referral to a single-centre, large-scale spine surgery service at the Hamilton General Hospital. Additionally, we sought to assess GPs' receptiveness to the triaging of their LBP referrals by NPCs. Our secondary objective was to determine the criteria that GPs use when referring their LBP cases to the aforementioned spine surgery service.

Methods

Survey development

The previously outlined parameters for successful surveying of healthcare professionals was used as a guideline throughout the survey development process (22). We developed a web-based cross-sectional survey to evaluate which criteria are important for GPs to consider when referring their LBP patients for a spine surgeon consultation, and to elucidate their feelings towards triaging of such referrals by NPCs. A 21 closed-ended question English language survey with a host of multiple choice and Likert Scale-style questions was piloted for face and content-validity across a selected cohort of GPs referring to the Hamilton General Hospital spine surgery service. These pilot respondents were not given the final copy of the survey to avoid any potential bias. Revisions included the removal of any sense of personal bias, complex jargon, judgmental tone, cultural insensitivity, and convolution from each question stem (23). The final 21-question survey assessed pertinent demographic information from respondents, their current referral practices, overall experiences with the spine surgery service at the Hamilton General Hospital, and receptiveness to an NPC-run triaging program. Prior to survey dissemination, the study received ethics approval through the Hamilton Integrated Research Ethics Board (HIREB 14-335).

Survey administration

We targeted all GPs who were currently in practice and members of the Hamilton Academy of Medicine (HAM), amounting to 281 potential respondents which represented over half of the entire Hamilton-area GP

Table 1 Respondent demographics

Item asked	No. [%] of 57 respondents
Age	
30–34	3 [5.3]
35–39	3 [5.3]
40–44	5 [8.8]
45–49	5 [8.8]
50–54	7 [12]
55–59	11 [19]
60–64	8 [14]
>65	13 [23]
Prefer to not disclose	2 [3.5]
Gender	
Male	30 [53]
Female	27 [47]
Current practice type (select all that apply)	
Academic	1 [1.8]
Community	42 [74]
Both (Academic + Community)	14 [25]
Number of years in practice	
1 year or less	0 [0]
2–5 years	2 [3.5]
5–10 years	4 [7.0]
>10 years	51 [89]
How many patients with a primary complaint of low back pain (LBP) would you estimate you see weekly in your practice?	
0	0 [0]
1	0 [0]
2	6 [11]
3	8 [14]
4	6 [11]
5	11 [19]
>6	26 [46]
How many patients with a primary complaint of LBP and associated radicular leg symptoms would you estimate you see weekly in your practice?	
0	8 [14]
1	19 [33]
2	14 [25]
3	8 [14]
4	3 [5.3]
5	2 [3.5]
>6	3 [5.3]

population referring to the Hamilton General Hospital spine surgery service. A brief personalized e-mail that included a cover letter to communicate the study objective, study implications, confidentiality, a defined time frame for completion, and relevant contact information was disseminated to these individuals on three separate occasions (each four-weeks apart) over the course of a 12-week period. Also included in this email was a secure link where respondents could anonymously access our survey via SurveyMonkey® (www.surveymonkey.com, Palo Alto, CA, USA), a password-protected online software. For those who did not respond to the initial request, a total of three separate reminder e-mails were administered to the HAM communications department.

Statistical analysis

Descriptive data was obtained from all completed surveys. Categorical, ordinal, and interval variables, which comprised the entire data set, were reported as counts and percentages. Most percentages were calculated with a denominator of 57 total respondents, except for ‘Referral criteria’ (den =56), ‘Referral practices’ (den =52), and ‘Receptiveness to Triage program’ (den =52). All statistical analyses were completed in consultation with a faculty biostatistician, using Microsoft Excel (Microsoft, Santa Rosa, CA, USA, 2008).

Results

Respondent demographics

Of a possible 281 GPs who were members of the HAM, 57 (20%) completed the survey. Gender was nearly equal among the respondents [30 (53%) were male], and most were over 50 years of age [39 (68%)] (*Table 1*). Of respondents, 42 (74%) were working in a community setting and 51 (89%) reported having more than ten years of clinical experience.

Most respondents [37 (65%)] saw at least 5 patients with a primary complaint of LBP per week. Physicians were less likely to encounter a case with both LBP and associated radicular leg symptoms, as only 16 (28%) respondents reported seeing more than three of these patients per week.

Experience with access to spine surgeons

Overall, there was dissatisfaction among respondents regarding the course of treatment for non-urgent LBP patients. Specifically, 48 (84%) of GPs admitted to

Table 2 Experience with access to spine surgeons

Item asked	No. (%) of 57 respondents
Do you experience personal frustration with the current referral process to spine surgeons?	
Yes	48 [84]
No	9 [16]
Do you experience personal frustration with the current long wait-times for patients to be assessed by spine surgeons?	
Yes	52 [91]
No	5 [8.8]
Have your patients expressed to you their frustrations with the current wait-times (currently 1–2 years) to see a spine surgeon?	
Yes	55 [96]
No	2 [3.5]

experiencing personal frustration with the current referral process to spine surgeons. A large majority of respondents [52 (91%)] admitted personal frustration with long wait-times for spine surgeon assessment of their patients, with 55 (96%) stating their patients had expressed similar annoyance with the long waiting period (Table 2).

Referral criteria

Participants were asked a series of Likert-scale questions (responses ranging from ‘Strongly Agree’ to ‘Strongly Disagree’) with a total of 56 respondents completing this component of the survey. Fifty respondents (89%) were in disagreement that persistent LBP even after a minimum 6 weeks of analgesics warranted referral. A similar majority of GPs [46 (82%)] also denied the necessity of a surgical consultation if LBP continued after a reasonable trial of physiotherapy. However, 50 (89%) of respondents were in strong agreement that LBP with concurrent bowel and/or bladder incontinence was sufficient cause for spine surgeon referral. A similar trend for LBP with possible neoplastic cause was observed, as 46 (82%) of GPs at least somewhat agreed in the need to send these patients for a specialist’s opinion. Conversely, three quarters [42 (75%)] of participants did not feel that cases with LBP and multiple episodic flare-ups were worthy of a consultation. A surprising minority of GPs [22 (39%)] referred for LBP that prevented a patient from returning to work, and a similar proportion [23 (41%)] admitted to referring LBP cases based on uncertainty of etiology (Table 3).

Referral practices

Among 52 respondents’ pre-spine surgeon referral practices, 30 (58%) indicated they never ordered a CT of the lumbar spine prior to referral (Table 4). With regards to clinical indicators of CT and/or MRI investigation of the lumbar spine, ‘Bowel/bladder incontinence’ unsurprisingly obtained a 100% response. Thirty-four (65%) respondents indicated they “Usually, but not always” referred to a physiatrist for consultation and an electromyography/nerve conduction velocity (EMG/NCV) study assessment prior to referral.

To ensure patient-centered care, 49 (94%) participants attempted to educate their patients with LBP on the rationale for referral and explained what interventions might be proposed upon consultation. Similarly, 50 (96%) respondents routinely addressed their patient’s thoughts on having surgery, should it be necessary for their LBP. Among respondents, all (100%) agreed that all CT and/or MRI reports should be reviewed with their patient prior to referral.

Receptiveness to a Triage program

From a total of 52 respondents, referring patients with LBP to an NPC-run triage program was supported by 46 (88%) GPs (Table 5). A similar proportion [44 (85%)] of GPs supported surgical screening assessment and subsequent referral recommendations by nurse practitioners, especially in cases where a patient’s CT and/or MRI was inconclusive. Most participants (50 (96%)) would feel comfortable with a Physiotherapist-led spine triage program, with support of Nurse Practitioner or Physician Assistant-run triage programs less favoured at 28 (54%) votes. Thirty-two (62%) respondents indicated they had prior experience in referring cases to an NPC pre-screening LBP clinic.

The survey also assessed if GPs would be interested in spearheading their own triage initiatives. Forty-two (81%) respondents were receptive to courses that teach GPs about LBP-specific physical examination and triaging techniques that are directed by spine surgeons with continuing medical education (CME) credits. Fewer [33 (66%)] participants, however, were open to courses offered through an online, web-based curriculum.

Discussion

Our survey revealed an overwhelming dissatisfaction among GPs regarding wait times for spine surgery consultation

Table 3 Referral criteria

Item asked	No. [%] of 56 respondents
I refer my patients to a spine surgeon when the following symptoms are reported/present: low back pain (LBP) persisting after a reasonable trial (minimum 6 weeks) of analgesics	
Strongly disagree	25 [45]
Somewhat disagree	7 [13]
Disagree	18 [32]
Agree	2 [3.6]
Somewhat agree	3 [5.4]
Strongly agree	1 [1.8]
LBP persisting after a reasonable trial (minimum 6 weeks) of physiotherapy	
Strongly disagree	18 [32]
Somewhat disagree	11 [20]
Disagree	17 [30]
Agree	3 [5.4]
Somewhat agree	6 [11]
Strongly agree	1 [1.8]
LBP with radicular leg pain and/or leg numbness/paresthesia's	
Strongly disagree	4 [7.1]
Somewhat disagree	3 [5.4]
Disagree	9 [16]
Agree	17 [30]
Somewhat agree	17 [30]
Strongly agree	6 [11]
LBP with bowel and/or bladder incontinence	
Strongly disagree	1 [1.8]
Somewhat disagree	0 [0]
Disagree	0 [0]
Agree	5 [9.0]
Somewhat agree	0 [0]
Strongly agree	50 [89]
LBP with possible neoplastic cause	
Strongly disagree	1 [1.8]
Somewhat disagree	3 [5.4]
Disagree	6 [11]
Agree	7 [13]
Somewhat agree	9 [16]
Strongly agree	30 [54]

Table 3 (continued)**Table 3** (continued)

Item asked	No. [%] of 56 respondents
LBP for which I am uncertain of the cause and wish to seek an expert opinion	
Strongly disagree	7 [13]
Somewhat disagree	9 [16]
Disagree	17 [30]
Agree	4 [7.1]
Somewhat agree	17 [30]
Strongly agree	2 [3.6]
LBP with multiple episodic flare-ups	
Strongly disagree	10 [18]
Somewhat disagree	15 [27]
Disagree	17 [30]
Agree	4 [7.1]
Somewhat agree	9 [16]
Strongly agree	1 [1.8]
LBP preventing patients from returning to work	
Strongly disagree	9 [16]
Somewhat disagree	8 [14]
Disagree	17 [30]
Agree	9 [16]
Somewhat agree	12 [21]
Strongly agree	1 [1.8]

for patients with LBP. Most primary care physicians pursue surgical referral in cases of persistent LBP with concurrent bowel and/or bladder incontinence and separately with concurrent radicular leg pain, or possible neoplastic origin. Respondents were quite conservative in their identification of the clinical indices that warrant subsequent diagnostic imaging, with MRI of the lumbar spine often accompanying referral to a spine surgeon. Once a decision was made regarding consultation, an overwhelming majority of GPs empowered their patients by ensuring transparency and addressing any apprehensiveness about the management process going forward. To streamline referrals, GPs expressed a strong support for LBP triage programs run by NPCs, particularly advanced practice physiotherapists, who would conduct surgical screening assessments and subsequent surgical and non-surgical referral recommendations for their patients. Although the majority

Table 4 Referral practices

Item asked	No. [%] of 52 respondents
Do you order a CT of the lumbar spine prior to referral to a spine surgeon?	
Yes, always	7 [13]
Usually, but not always	15 [29]
No, never	30 [58]
Do you order a MRI of the lumbar spine prior to referral to a spine surgeon?	
Yes, always	35 [67]
Usually, but not always	16 [31]
No, never	1 [1.9]
What are your clinical indications for order a CT and/or an MRI of the lumbar spine for patients with low back pain (LBP)? [select all that apply]	
Persistent LBP for >6 weeks	17 [33]
Lower extremity weakness	48 [92]
Lower extremity sensory deficits	45 [87]
Bowel/bladder incontinence	52 [100]
Recent history of significant trauma	42 [81]
History of cancer	43 [83]
Do you refer to a physiatrist for consultation and an electromyography/nerve conduction velocity (EMG/NCV) study assessment prior to referral to a spine surgeon?	
Yes, always	10 [19]
Usually, but not always	34 [65]
No, never	8 [15]
When referring to a spine surgeon, do you first educate the patient on the rationale for the referral and what interventions a spine surgeon may offer?	
Almost always	37 [71]
To a considerable degree	12 [23]
Occasionally	2 [3.9]
Seldom	1 [1.9]
When referring to a spine surgeon, do you ask the patient whether they would consider having spinal surgery (especially your elderly patients)?	
Almost always	44 [85]
To a considerable degree	6 [12]
Occasionally	1 [1.9]
Seldom	1 [1.9]
Before referring patients to a spine surgeon, do you review the CT and/or MRI report results with the patient?	
Almost always	48 [92]
To a considerable degree	4 [7.7]
Occasionally	0 [0]
Seldom	0 [0]

of respondents had previous experience in utilizing such a service, many GPs demonstrated an interest in learning more about how they can better integrate spine triaging initiatives into their decision-making process.

The implementation of triaging programs to expedite wait lists for patients with LBP seeking spine surgeon consultation has garnered international attention. However, with various research teams assessing the feasibility and impact of such an initiative, the culmination of evidence to date is heterogeneous (24). Though the exact nature of how such programs should come to fruition has not yet been established, there is clear interest among many key stakeholders to streamline this process from a resource management and patient-flow perspective (17,25). In particular, Busse *et al.* (17) administered a survey to Canadian spine surgeons and found that 77.6% of respondents were interested in an allied-health professional pre-screening led model of care. More recently, Rempel *et al.* (25) used a very similar approach to assess patients' attitudes toward non-physician screening of their condition and observed that a large majority of respondents (88.8%) would support a program of this nature, with nearly half considering neither distance nor out-of-pocket payment to be a potential barrier. Thus, it appears to be clear that patients, primary care physicians, and Canadian spine surgeons involved in the managing LBP appear to be overwhelmingly in favour of implementing allied health professional-led LBP triaging programs.

With a "patient-centered" model of care being emphasized throughout the medical community, streamlining the management of patients with LBP through triaging is inherently warranted. NPCs with an appropriate scope of practice to serve such an initiative include nurse practitioners, chiropractors, occupational therapists, athletic therapists, and physiotherapists (26). Due to their musculoskeletal expertise and autonomy for referral, the latter subgroup is consistently at the forefront of discussion (15,21,24,26-30). In particular, advance practice physiotherapists (APPs) whom are trained alongside orthopedic surgeons have high clinical diagnostic accuracy, thus increasing the efficiency of the referral process (16,27-29). Recently, Robarts *et al.* (27) demonstrated an observed agreement of 86.3% on decision for surgical consultation for LBP patients between an orthopedic surgeon and an APP. Furthermore, the present survey highlights primary care physicians' current practice of accompanying referrals with costly diagnostic imaging (10). Through spine triage programs spearheaded by NPCs,

Table 5 Triage program

Item asked	No. [%] of 52 respondents
Would you be open to referring your patients to a Spine Surgery Clinic whereby initial consultation would be performed by a Physiotherapist/Physician Assistant/Nurse Practitioner who have focused training in lumbar spine assessment and pathologies, if such a consultation occurred within 1–2 months of your referral? <i>[In which the above health care professional will be independently trained and affiliated with a spine surgeon(s)]</i>	
Yes	46 [88]
No	6 [12]
With a large number of referrals received weekly by spine surgeons, most triaging occurs by reviewing the MRI report findings. However, at times, some patients that have minimal/mild findings on MRI are surgical candidates based on their clinical examination. As a result, properly trained Physiotherapists/Physician Assistants/Nurse Practitioners can augment the triaging model by providing a proper surgical screening assessment. Do you feel that have a Physiotherapist/Physician Assistant/Nurse Practitioner make recommendations for referral directly to a spine surgeon is a model to consider for better management of low back pain (LBP)?	
Yes, always	44 [85]
No	8 [15]
Incorporating other health care professionals to assist with the consultation/screening process for spine surgery referrals has demonstrated a reduction in wait-times in the literature. Please choose the health care professionals you are comfortable referring to in order to facilitate spine care for your patient? <i>[select all that apply]</i>	
Physiotherapist	50 [96]
Physician assistant	28 [54]
Nurse practitioner	28 [54]
Would you be interested in learning more specialized physical examination and triaging techniques for the assessment and management of LBP if	
Courses were opened to family physicians free of charge directed by spine surgeons with continuing medical education (CME) credits?	
Yes	42 [81]
No	10 [19]
Standardized online courses were offered free of charge with CME credits?	
Yes	33 [63]
No	19 [37]
Have you had any prior experience referring patients to spine screening clinics in which your patient(s) is assessed by a Physiotherapist/Physician Assistant/Nurse Practitioner	
Yes	32 [62]
No	20 [38]

there is a potential to minimize seemingly futile CT and MRI scanning and maximize holistic evaluation and management strategies (27,30,31).

Although Boakye *et al.* appropriate a GP's scope of practice within the initial assessment phase prior to NPC-led triaging of LBP patients (26), the referral criteria identified by respondents included in the present study are in line with established guidelines (24,27,30,31). In particular, GPs identified concurrent LBP and radicular

leg pain, leg numbness/paraesthesias, bowel and/or urinary incontinence, and possible neoplastic cause as clinical indices that warrant consultation with a spine surgeon. Furthermore, GPs reportedly educate their patients on evidence surrounding LBP as well as what they should expect going forward, which is an inherently patient-centered approach. This finding might suggest that GPs are equipped with the tools to triage their patients alongside NPCs—however, a major component of this

type of program is implementing management strategies for those deemed ineligible for surgery (30,31). Though these recommendations require an expertise of the musculoskeletal system, which might be outside the scope of practice for GPs, future studies aimed at uncovering GPs' approach to care are warranted.

Limitations

We were only able to accrue 57 responses from 281 total GPs that the survey was initially disseminated to. Given that our response rate of 20% falls below the 54% benchmark proposed by Asch *et al.* (32), which was based on mailed-in surveys rather than online administration, our results face inherent limitations. However, recent qualitative studies targeting Canadian (33-35) and foreign (36-38) GPs have reported a similarly low response rate, suggesting that survey administration is difficult to conduct among this physician population. Indeed, our results are in line with the expected sub-40% response rate for online questionnaires with physician respondents (39). Response bias must also not be discounted from the present study, as GPs who have had more positive experiences with accessing spine surgery care for their patients may have been more apt to respond. It is also likely that GP frustrations with the Hamilton-area spine surgery service was exceedingly high at the time of survey administration, as non-urgent referral wait times exceeded 18 months on average. Furthermore, targeting only those GPs who were members of the HAM retracts from the national and international applicability of the present findings. However, physician frustration with long-wait times and access to spine surgeon consultations for their patients is a well-known frustration across Canada (40). This notion is especially relevant for private health care systems, as patients in this setting might not experience wait times that are extreme enough to warrant triaging by NPCs.

Conclusions

Current experiences for patients and primary care physician referrers of individuals with LBP is poor with respect to accessing spine surgeon consultation services. Using NPCs and in particular physiotherapists to lead triaging programs for patients with LBP is well-received by GPs. The utilization of such referral programs has the potential to expedite appropriate care pathways for patients with LBP and better utilize diagnostic imaging resources and spine surgeon consultation. Future research endeavors

need to assess the cost-effectiveness and feasibility of such government run NPC LBP screening programs to better assess patient experiences, outcomes and resource utilization if such a shift from the current spine surgical consultation model is to occur.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/jhmhp.2018.09.01>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). Informed consent was waived due to the nature of the study. Prior to survey dissemination, the study received ethics approval through the Hamilton Integrated Research Ethics Board (HIREB 14-335).

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References

- 1 Simon D, Coyle M, Dagenais S, et al. Potential triaging of referrals for lumbar spinal surgery consultation: a comparison of referral accuracy from pain specialists, findings from advanced imaging and a 3-item questionnaire. *Can J Surg* 2009;52:473-80.
- 2 Braybrooke J, Ahn H, Gallant A, et al. The impact of surgical wait time on patient-based outcomes in posterior lumbar spinal surgery. *Eur Spine J* 2007;16:1832-9.
- 3 Kidane B, Gandhi R, Sarro A, et al. Is referral to a spine

- surgeon a double-edged sword? Patient concerns before consultation. *Can Fam Physician* 2011;57:803-10.
- 4 Dagenais S, Roffey DM, Wai EK, et al. Can cost utility evaluations inform decision making about interventions for low back pain? *Spine J* 2009;9:944-57.
 - 5 Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *Spine J* 2008;8:8-20.
 - 6 Rhon D, Fritz J. COMParative Early Treatment Effectiveness between physical therapy and usual care for low back pain (COMPETE): study protocol for a randomized controlled trial. *Trials* 2015;16:423.
 - 7 Hurlbert RJ, Mobbs R, Teo C. Access to spine care: a tale of two cities. *Can J Neurol Sci* 2008;35:308-13.
 - 8 Lefevre-Colau MM, Fayad F, Coriat F, et al. Frequency and interrelations of risk factors for chronic low back pain in a primary care setting. *PLoS One* 2009;4:e4874.
 - 9 Deis N, Findlay JM. Appropriateness of lumbar spine referrals to a neurosurgical service. *Can J Neurol Sci* 2010;37:843-8.
 - 10 Busse JW, Riva JJ, Rampersaud R, et al. Spine surgeons' requirements for imaging at the time of referral: a survey of Canadian spine surgeons. *Can J Surg* 2014;57:E25-30.
 - 11 Andersen JC. Is immediate imaging important in managing low back pain? *J Athl Train* 2011;46:99-102.
 - 12 Sabnis AB, Diwan AD. The timing of surgery in lumbar disc prolapse: A systematic review. *Indian J Orthop* 2014;48:127-35.
 - 13 Wilgenbusch CS, Wu AS, Fournery DR. Triage of spine surgery referrals through a multidisciplinary care pathway: a value-based comparison with conventional referral processes. *Spine (Phila Pa 1976)* 2014;39:S129-35.
 - 14 Kindrachuk DR, Fournery DR. Spine surgery referrals redirected through a multidisciplinary care pathway: effects of nonsurgeon triage including MRI utilization. *J Neurosurg Spine* 2014;20:87-92.
 - 15 Bath B, Grona SL, Janzen B. A spinal triage programme delivered by physiotherapists in collaboration with orthopaedic surgeons. *Physiother Can* 2012;64:356-66.
 - 16 Bath B, Janzen B. Patient and referring health care provider satisfaction with a physiotherapy spinal triage assessment service. *J Multidiscip Healthc* 2012;5:1-15.
 - 17 Busse JW, Riva JJ, Nash JV, et al. Surgeon attitudes toward nonphysician screening of low back or low back-related leg pain patients referred for surgical assessment. *Spine (Phila Pa 1976)* 2013;38:E402-8.
 - 18 Alentado VJ, Lubelski D, Steinmetz MP, et al. Optimal duration of conservative management prior to surgery for cervical and lumbar radiculopathy: a literature review. *Global Spine J* 2014;4:279-86.
 - 19 Sarro A, Rampersaud R, Lewis S. Nurse practitioner-led surgical spine consultation clinic. *J Adv Nurs* 2010;66:2671-6.
 - 20 Dunlop P, McLaughlin L, Goldsmith C. 152 - Non-physician triage in patients with low back pain, sciatica, and spinal stenosis. *Orthop Proc* 2011;93-B:584.
 - 21 Dunlop P, Ramonas M, Goldsmith C, et al. Can a qualified non-physician expert predict the usefulness of MRI scans in patients with back related complaints? *Orthop Proc* 2012;94-B:204.
 - 22 Burns KE, Duffett M, Kho ME, et al. A guide for the design and conduct of self-administered surveys of clinicians. *CMAJ* 2008;179:245-52.
 - 23 Stone DH. Design a questionnaire. *BMJ* 1993;307:1264-6.
 - 24 McEvoy C, Wiles L, Bernhardsson S, et al. Triage for Patients with Spinal Complaints: A Systematic Review of the Literature. *Physiother Res Int* 2017;22.
 - 25 Rempel J, Busse JW, Drew B, et al. Patients' attitudes toward non-physician screening of low back and low back-related leg pain complaints referred for surgical assessment. *Spine (Phila Pa 1976)* 2017;42:E288-93.
 - 26 Boakye O, Birney A, Suter E, et al. Scope of practice review: providers for triage and assessment of spine-related disorders. *J Multidiscip Healthc* 2016;9:227-35.
 - 27 Roberts S, Stratford P, Kennedy D, et al. Evaluation of an advanced-practice physiotherapist in triaging patients with lumbar spine pain: surgeon-physiotherapist level of agreement and patient satisfaction. *Can J Surg* 2017;60:266-72.
 - 28 Roberts S, Kennedy D, MacLeod A, et al. A framework for the development and implementation of an advanced practice role for physiotherapists that improves access and quality of care for patients. *Healthc Q* 2008;11:67-75.
 - 29 Kennedy DM, Roberts S, Woodhouse L. Patients are satisfied with advanced practice physiotherapists in a role traditionally performed by orthopaedic surgeons. *Physiother Can* 2010;62:298-305.
 - 30 Tacy RM, Donaworth S, Ballman K. Application of primary care guideline for chronic low back pain in the emergency department. *Adv Emerg Nurs J* 2017;39:123-40.
 - 31 Bardin LD, King P, Maher CG. Diagnostic triage for low back pain: a practical approach for primary care. *Med J Aust* 2017;206:268-73.
 - 32 Asch DA, Jedrzejewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol* 1997;50:1129-36.

- 33 Morin C, Desrosiers J, Gaboury I. Descriptive study of interprofessional collaboration between physicians and osteopaths for the pediatric population in Quebec, Canada. *BMC Health Serv Res* 2017;17:726.
- 34 Myhre D, Szafran O, Schipper S, et al. Scope of practice of family medicine graduates who completed a rural versus urban program. *Rural Remote Health* 2018;18:4514.
- 35 Walden LM, Brandl EJ, Changasi A, et al. Physicians' opinions following pharmacogenetic testing for psychotropic medication. *Psychiatry Res* 2015;229:913-8.
- 36 Artus M, van der Windt DA, Afolabi EK, et al. Management of shoulder pain by UK general practitioners (GPs): a national survey. *BMJ Open* 2017;7:e015711.
- 37 Llor C, Vilaseca I, Lehrer-Coriat E, et al. Survey of Spanish general practitioners' attitudes toward management of sore throat: an internet-based questionnaire study. *BMC Fam Pract* 2017;18:21.
- 38 Kivekäs E, Enlund H, Borycki E, et al. General practitioners' attitudes towards electronic prescribing and the use of the national prescription centre. *J Eval Clin Pract* 2016;22:816-25.
- 39 Cunningham CT, Quan H, Hemmelgarn B, et al. Exploring physician specialist response rates to web-based surveys. *BMC Med Res Methodol* 2015;15:32.
- 40 Gill A, Kuluski K, Jaakkimainen L, et al. "Where do we go from here?" Health system frustrations expressed by patients with multimorbidity, their caregivers and family physicians. *Health Policy* 2014;9:73-89.

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