

A randomized study of the effect of a job video on occupational health providers' understanding of injured workers' job tasks and return to work practices

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**Abstract**

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*Purpose* This study assessed how a job video together with a written job description, compared to a job description alone, affects occupational health providers' knowledge about the job of injury and return to work (RTW) practices.

*Methods* Nineteen occupational health providers were randomized to review a clinical case along with a job description (usual practice group) or along with a job description and a job video (intervention group). Differences in pre-post knowledge and RTW practices were assessed using the sign test. The Cochran-Armitage exact test was used to assess differences in pre-post score differences between groups.

*Results* Ten occupational health providers were randomly assigned to the intervention group, and nine to the usual practice group. Providers demonstrated increased confidence in determining injury causation ( $p = 0.016$ ) and explaining mechanism of injury to the patient ( $p = 0.008$ ) after reviewing the clinical case with a job video. However, there was no statistically significant difference in pre-post score differences between groups. Participants reported that job videos may be useful in the clinical setting to enhance provider understanding of work tasks, establish patient rapport, and increase worker motivation to RTW.

*Conclusions* This study demonstrated the feasibility of evaluating job videos in a clinical occupational health setting. Although job videos may be a useful addition to clinical practice, further work is needed to determine how job videos might best be incorporated into the clinical workflow in order to improve patient outcomes. Larger studies are also needed to further examine differences in outcomes between providers that integrate job videos into their practice compared to those who do not.

**Keywords** Randomized controlled trial, workers' compensation, video recording, job description, occupational medicine, return to work, causation, occupational health physicians

## Introduction

Work-related musculoskeletal disorders (WMSDs) are one of the most common work-related conditions seen by occupational health providers. WMSDs accounted for 39.3% of claims accepted by the Washington State Department of Labor and Industries (WA LNI) between 2006 to 2015 and costs were over \$3.8 billion dollars.[1] The average time loss, or missed work days, per shoulder claim was 368.4 with a median of 125 days. [1] Data have shown that early return-to-work (RTW) or workers' involvement in some type of daily activity are important aspects for recovery from musculoskeletal disorders.[2],[3] A population based study in Washington State demonstrated that workers who remain on disability for longer than two to three months have a greatly reduced chance of RTW.[4] Epidemiologic studies have shown that unemployment has a strong association with many adverse health outcomes.[5]

Occupational health providers are in a critical position to improve patient outcomes, facilitate the RTW process, and reduce disability of the injured worker. Providers may recommend workplace accommodations, tailored to the job of injury or alternative jobs, including modified duties, workstation redesign, activity restrictions, reduced hours, or other efforts to reduce physical or mental demands of the injured worker during recovery.[2,6] Some challenges faced by physicians in engaging in RTW best practices include limited knowledge, skills, and conceptions of a physician's role in RTW, hesitancy or negative attitudes toward various workplace stakeholders, and challenges in communicating with workplaces about RTW possibilities.[6]

Horppu et al utilized two theoretical frameworks, the Behaviour Change Wheel (BCW) and the Theoretical Domains Framework (TDF), to assess potential factors that influence occupational healthcare providers' behaviors in the RTW process.[6] These behaviors include: 1) initiating temporary work modifications during consultation with the employee; 2) making recommendations to the workplace; and 3) monitoring the work modification process.[6] Understanding injured workers' job duties may allow providers to more effectively plan for graduated return to work duties as the worker recovers.

Though health providers can obtain information about an injured worker's job, the information may not be sufficient or timely. Workers may describe their job duties to health providers verbally during the healthcare visit, or employers may submit to the healthcare provider a written job description or job analysis describing the job tasks. However, the job description and job analysis documents are not always available at the initial clinic visit, do not provide spatial information in a visual format, and may not be specific to the injured worker's experience on the job.

Although research has shown that early, safe RTW improves recovery, reduces absence time, and decreases long-term disability [7], there are no studies that we are aware of that have evaluated whether job video content would improve RTW outcomes. The primary objective of this study was to assess how the use of a job video in addition to a written job description, compared to a written job description alone, affects occupational health providers' knowledge about the job of injury and RTW practices. We also sought to determine occupational healthcare providers' attitudes about the use of a job video in the management of injured workers.

## Methods

Occupational healthcare providers were recruited to review a clinical case of an electrician with shoulder strain. Shoulder strain was selected for the case example because anatomy of the shoulder is complex, prevalence rates of shoulder claims are high, and management can be complicated and costly. Per the Washington State Department of Labor and Industries (WA LNI) report on 159,633 State Fund and Self-Insured accepted compensable WMSDs claims from 2006-2015, the direct costs for WMSD claims totaled \$3.7 billion, and shoulder WMSDs were the most costly, averaging \$65,053 total direct cost per State Fund claim, compared to \$49,678 for back claims.[1]

An electronic module was developed to assess participants' knowledge and RTW practices before and after viewing a job description, or a job description with a job video, and to assess general attitudes about the use of job videos in a clinical setting. Study procedures were approved by the University of Washington Institutional Review Board, and participants provided informed consent prior to participation.

### Module Content and Format

An online module was developed using Research Electronic Data Capture (REDCap) Surveys, a secure Health Insurance Portability and Accountability Act (HIPAA) compliant system hosted by the University of Washington.[8] The module included an electronic consent agreement, an introduction to the research study, descriptive clinical case scenario, a job description, a job video (in the intervention group), and survey questions.

A generic clinical case scenario of an electrician with shoulder strain was developed. The scenario included details of common shoulder strain symptoms and pertinent patient history details, physical exam findings, and a brief description of work tasks. These details were not based on a specific patient and did not include any specific patient identifiers. A written job description of an electrician was adapted from one found on a local employer's human resources hiring website.

After providing consent, electricians performing three specific job tasks at a commercial construction site were recorded on a mobile camera, and the footage was edited into a thirty second video. The three job tasks included installation of a light fixture, a small conduit containing electrical wires, and a large electrical conduit. These three tasks involved overhead work frequently associated with shoulder injuries.[9]

### *Survey*

As no validated questionnaires were available that assessed occupational healthcare providers knowledge and RTW practices, survey questions were adapted from a previously published study.[10] The survey was divided into three parts: 1) pre-intervention knowledge and RTW practice questions and demographic and other baseline questions, 2) post-intervention knowledge and RTW practice questions, and 3) general attitude questions.

In addition to six demographic questions, baseline behaviors addressing the frequency of communication with injured workers and employers were assessed (e.g. "daily", "twice a week", "weekly", "every two

weeks”, “once a month”, “not at all”). There were also baseline questions assessing what typical resources providers utilize to learn about a worker’s job tasks (e.g. “internet search”, “job description”, “job analysis”, “communication with supervisor/employer”, “other”).

Pre-intervention survey questions included questions about knowledge about the worker’s jobs (two questions) and RTW practices (four questions). Participants were asked to grade their responses to knowledge questions on a 5-point scale representing degrees of agreement (e.g. 1 = “strongly disagree”, 2 = “disagree”, 3 = “neither disagree nor agree”, 4 = “agree”, 5 = “strongly agree”). Knowledge questions assessed the mechanism of injury and injured employee’s physical work demands. Questions about RTW practices were assessed using a 4-point confidence scale (e.g. 1 = “not very confident”, 2 = “somewhat confident”, 3 = “moderately confident”, 4 = “very confident”). RTW practice questions addressed confidence in determining work-relatedness, explaining mechanism of injury to injured worker, tailoring the activity prescription form (APF), and communicating with the employer. Post-intervention questions included the same knowledge and RTW practice questions as before the module.

General attitudes on job videos in the clinical setting were assessed with seven yes/no questions with free text comment sections. These included qualitative questions on whether a job video could enhance providers’ understanding of worker tasks, help establish rapport with patients, increase buy-in in returning to work, and the practicality of incorporation of a job video into the clinic workflow.

### *Beta Testing*

Three beta testers were recruited from faculty ranks at the University of Washington, Department of Environmental and Occupational Health Sciences, including occupational medicine physicians. Beta testers were asked to navigate through the REDCap modules and offer feedback on the survey questions, flow, and structure. Appropriate modifications to the module were made based on the feedback with consensus from the research team.

### **Study Procedures**

A parallel-group study, using a block randomized design, was conducted to compare the effect of a job video, versus job description alone, on occupational healthcare providers’ knowledge and RTW practices.

Nineteen occupational health providers were randomly assigned to review a clinical case of an electrician with a shoulder strain along with a job description (usual practice group) or along with a job description in conjunction with a job video (intervention group). Usual practice participants viewed the job video upon completing post knowledge and practice survey questions, and all participants completed questions addressing attitudes about the use of a job video in the clinical setting at the end of the survey.

### *Study Site and Population*

Occupational healthcare providers associated with Washington State (WA) Centers of Occupational Health and Education (COHE) were recruited to participate in the study. The COHE program is a WA State-wide program that aims to improve injured worker outcomes and reduce disability through provider training and care coordination at selected healthcare sites.[11] There are six COHEs in WA, and providers who are part of a COHE are considered best practice providers by WA LNI.

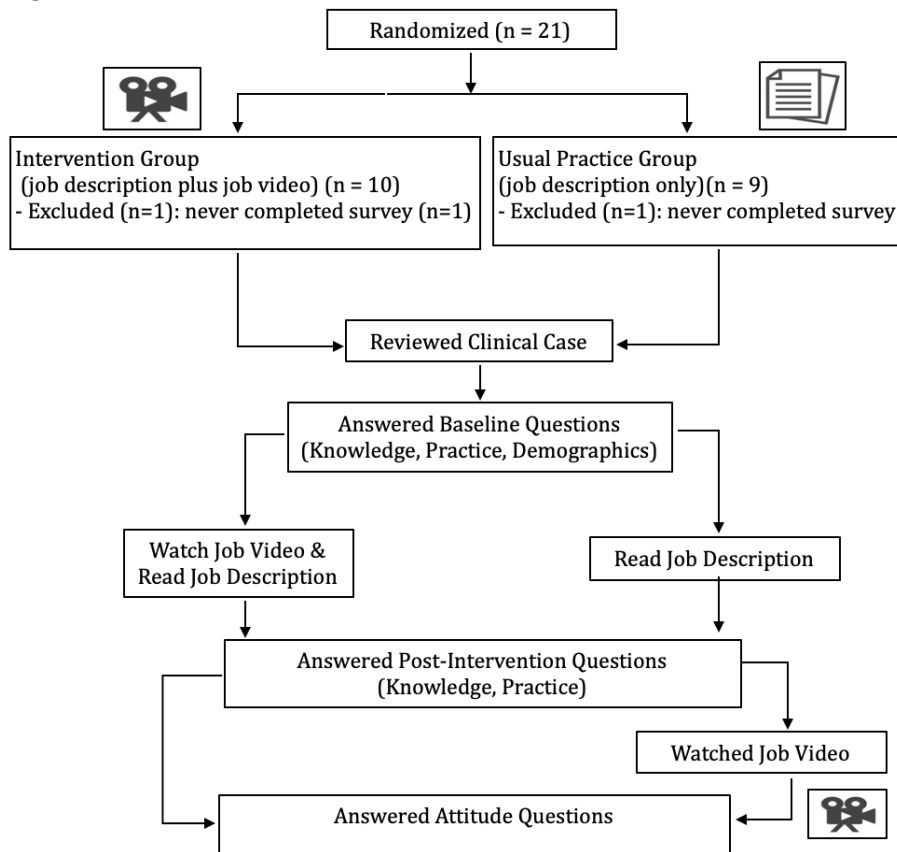
Occupational healthcare attending providers in WA COHEs may include physicians (MD or DO), physician assistants (PA), or advanced registered nurse practitioners (ARNP). Eligible participants included those with at least one year of experience in occupational medicine. The COHE at University of Washington, Harborview Medical Center was excluded because providers at this location were involved in discussions of the study design and survey beta testing.

*Recruitment and Enrollment*

An email invitation to participate in the study was distributed on the WA LNI COHE providers’ listserv. Interested participants were asked to contact research staff via email to set up an appointment or to be sent an email link to the module. To enhance recruitment, individual emails were sent to some providers at training rotation sites affiliated with the University of Washington Occupational Medicine Residency Program.

Participants underwent informed consent and were scheduled for in-person appointments with research staff to complete the online module. Research staff set up the online module on a laptop and had participants complete the module. Three providers were located more than four hours away and were sent an email hyperlink to the module. An additional provider preferred an email hyperlink due to scheduling issues. Two providers in total, one from each group, never completed the module during the study period. Details of study flow are shown in Fig. 1.

**Figure 1.**



### *Intervention and Follow-Up*

Participants were allocated to the intervention and usual practice groups using a block randomized design. Research staff generated a sequence using an online randomization tool with a block size of four for two treatment groups.[12] Recruited individuals were allocated to each group at the time they confirmed interest in participating in the study.[12] Participants were not informed about which group they were allocated. Participants randomized to the intervention group were provided a job description along with a job video after viewing the clinical scenario and answering baseline survey questions. Participants in the usual practice group were provided with a job description only. Both groups then answered post-module questions. The usual practice group then additionally viewed the job video prior to answering questions about value and practicality of job videos in the clinical setting.

### *Outcomes*

Outcomes were determined *a priori*. The primary outcomes were self-reported occupational health providers': 1) knowledge of job of injury, and 2) RTW practices. Secondary outcomes were qualitative and hypothesis-generating in nature, and assessed occupational health providers' attitudes about the use of job videos in the clinical workflow.

### **Analyses**

Participant characteristics were summarized using descriptive statistics. Differences in survey question scores addressing clinical knowledge and RTW practices after usual practice or video intervention, compared to before, were assessed using the sign test, assuming a binomial distribution. The Cochran-Armitage exact test was used to assess whether there were differences in pre-post score differences between groups. The aim was to assess whether improvement in knowledge and RTW practice scores were greater in the intervention compared to the usual practice group. Statistical tests were two-sided, and  $p$  values  $< 0.05$  were considered statistically significant. Descriptive data on general attitudes on the value and practicality of job videos in the clinical setting were summarized using descriptive statistics. Themes were drawn from free text comments and summarized. Statistical analyses were performed using R 3.2.1 (R Foundation, Vienna, Austria)[13] and Stata 11 (StataCorp, College Station, TX).

## **Results**

Baseline participant characteristics by group are shown in Table 1. The majority of participants were aged 45 years or older (63%) and female (52%). The majority (74%) of participants had either a Doctor of Medicine (MD) or Osteopathic Medicine (DO) degree. Sixty-eight percent of participants were board certified in occupational medicine. Other specialties included internal medicine and family medicine.

**Table 1** Participant Characteristics

Participant characteristic	Intervention (n = 10)	Usual Practice (n = 9)
Demographic		
Age group <sup>a</sup>		
< 45	3 (30 %)	3 (33 %)
≥ 45	7 (70 %)	5 (56 %)

Sex		
Male	4 (40 %)	5 (56 %)
Female	6 (60 %)	4 (44 %)
Clinical background		
Degree		
Doctor of Medicine (MD) / Osteopathic Medicine (DO)	7 (70 %)	7 (78 %)
Physician Assistant (PA) / Advanced Registered Nurse Practitioner (ARNP)	3 (30 %)	2 (22 %)
Board certification specialty <sup>b</sup>		
Occupational Medicine	6 (60 %)	7 (78 %)
Internal Medicine	3 (30 %)	2 (22 %)
Family Medicine	3 (30 %)	2 (22 %)
Other	2 (20 %)	1 (11 %)
Occupational health experience		
Center for Occupational Health and Education (COHE)		
COHE 1	2 (20 %)	3 (33 %)
COHE 2	1 (10 %)	0 (0 %)
COHE 3	1 (10 %)	0 (0 %)
COHE 4	2 (20 %)	1 (11 %)
COHE 5	4 (40 %)	5 (56 %)
Years practicing occupational medicine independently		
≤ 10	6 (60 %)	4 (44 %)
> 10	4 (40 %)	5 (56 %)
Workers' compensation patients seen in one week		
< 25	1 (10 %)	2 (22%)
≥ 25	9 (90 %)	7 (78 %)
Familiarity with electrical work through personal or clinical experience	4 (40 %)	3 (33 %)
Resource typically used to learn about job tasks <sup>b</sup>		
Internet search	0 (0 %)	2 (22 %)
Job description	7 (70 %)	8 (89 %)
Job analysis	7 (70 %)	9 (100 %)
Communication with supervisor/employer	7 (70 %)	9 (100 %)

Other	2 (20 %)	4 (40 %)
Typical return to work practices		
Frequency of typical communication with injured worker		
At least every two weeks	7 (70 %)	7 (78 %)
Once a month	1 (10 %)	1 (10 %)
Frequency of typical communication with employer		
At least every two weeks	2 (20 %)	2 (20 %)
Once a month	6 (60 %)	5 (56 %)
Frequency of job descriptions typically provided at first visit		
< 50% of the time	10 (100 %)	9 (100 %)
> 50% of the time	0 (0 %)	0 (0 %)
Frequency in reviewing provided job descriptions		
< 50% of the time	1 (10 %)	1 (11 %)
> 50% of the time	9 (90 %)	8 (89 %)

<sup>a</sup> One participant in the usual practice group preferred not to respond.

<sup>b</sup> Multiple options could be selected.

Sixty percent of participants in the intervention group practiced occupational medicine for ten or fewer years, whereas the majority (56%) of participants in the usual practice group had greater than 10 years of experience in occupational medicine. Ninety percent of participants in the intervention group and 78% of participants in the usual practice group usually saw 25 or more workers' compensation patients in one week. Less than half of individuals in both groups had familiarity with electrical work through personal experience performing electrical work, from knowing a friend or family member with an electrician background, or from clinical experience treating electricians for more than 25% of their practice.

In general, participants utilized various resources in order to learn about worker job tasks. If provided a job description, 70% of participants in the intervention group and 89% in the usual practice group reviewed it. If provided a job analysis, 70% of participants in the intervention group, and 100% in the usual practice group reviewed it. Seventy percent of participants in the intervention group, and 100% in the usual practice group usually contacted the supervisor or employer to learn about job tasks.

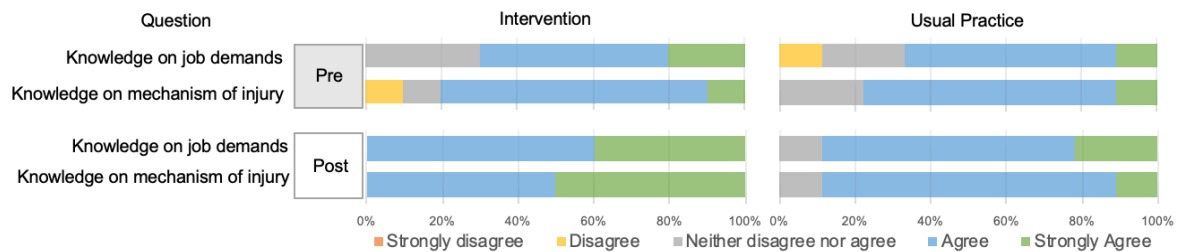
In terms of usual RTW behaviors, the majority (70%) in the intervention group and 78% in the usual practice group communicated with the injured worker at least every two weeks. Sixty percent of participants in the intervention group and 56% in the usual practice group communicated with the employer at least once a month. All participants stated that job descriptions were provided 50% or less of the time during the first visit. Ninety percent of participants in the intervention group and 89% of participants in the usual practice group reviewed the job description, if provided, more than half the time.

## Knowledge Changes Before and After Reviewing Clinical Case with Job Video and Job Description Compared to Job Description Alone

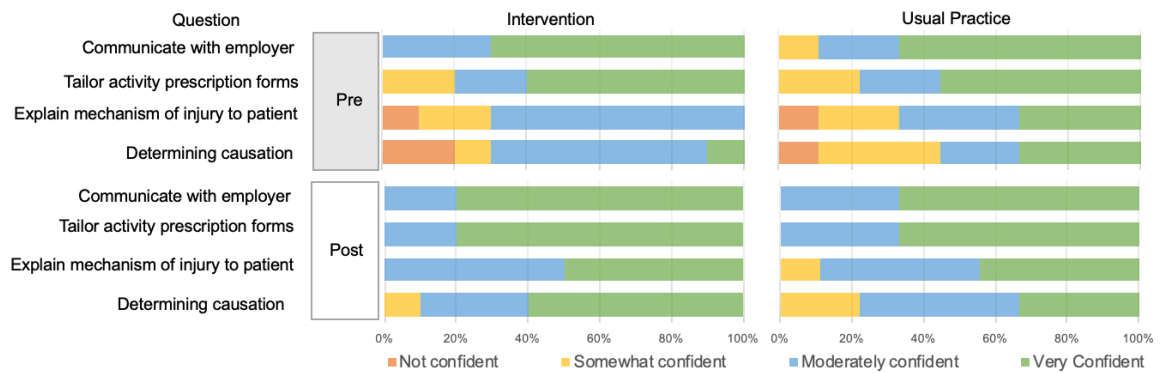
A summary of pre and post intervention responses to knowledge and practice questions is shown in Figure 2. At baseline, the majority of participants in the both usual practice and intervention group agreed that they understood the mechanism of injury and patient’s physical job demands (median score of 4 = “agree”). Although the median scores did not change for either group post intervention, five individuals in the intervention group had an increase in score ( $p = 0.063$ ), whereas only one individual in the usual practice group had an increase in score ( $p = 0.500$ ) on knowledge on mechanism of injury (Table 2). On knowledge on job demands, five individuals had an increase in score in the intervention group ( $p = 0.063$ ) and three individuals in the usual group (adjusted  $p = 0.125$ ).

**Figure 2** Participant responses to knowledge and practice questions pre and post intervention

a.



(b)



## Practice Changes Before and After Reviewing Case with Job Video and Job Description Compared to Job Description Alone

### Communications with the Employer

At baseline, the majority of participants in both the intervention and usual practice groups were already highly confident in communicating modified/light duty with the employer (median score of 4 = “very

confident”). However, the usual practice group had greater distribution of responses at baseline with an interquartile range (IQR) 3 - 4 compared to the intervention group (IQR = 3.25 - 4).

After the intervention, one individual in the intervention group had an increase in score ( $p = 1.000$ ), and two increased while one decreased in score for the usual practice group (adjusted  $p = 0.625$ ) (Table 2). Post intervention, the median did not change for either group, although the IQR for the usual practice group (IQR = 3 - 4) was still greater than that of the intervention group (IQR = 4 - 4).

#### Tailoring Activity Prescription Forms

At baseline, the majority of participants in both the intervention and usual practice groups were highly confident in tailoring activity prescription forms (median score of 4 = “very confident”). The distribution of responses at baseline was the same for both groups (IQR = 3 - 4).

Post-intervention, medians for tailoring activity prescription forms did not change (median score of 4 = “very confident”), but the IQR was greater for the usual practice group (IQR = 3 - 4) compared to the intervention group (IQR = 4 - 4). Two individuals in the intervention group had an increase in score ( $p = 0.500$ ), and three increased in score in the usual practice group (adjusted  $p = 0.125$ ) on confidence in tailoring the activity prescription form.

#### Explaining Mechanism of Injury to Patient

At baseline, both groups were only moderately confident in explaining the mechanism of injury to the patient (median score of 3 = “moderately confident), but in the usual practice group, there was a greater distribution of confidence levels (IQR = 2 - 4) as compared to the intervention group (IQR = 2.25 - 3).

Post-intervention, the median and distribution were similar for both groups (median score of 4 = “very confident, IQR = 3 - 4). Moreover, there was a statistically significant improvement in score in explaining the mechanism of injury for the intervention group only. Eight individuals in the intervention group had an increase in score ( $p = 0.008$ ), and only three individuals increased in score in the usual practice group ( $p = 0.125$ ).

#### Determining Injury Causation

At baseline, most participants in both groups were moderately confident in determining injury causation (median score of 3 = “moderately confident). However, there was a greater distribution of scores in the usual practice group (IQR = 2) compared to the intervention group (IQR = 0.75).

Post-intervention, most participants in the intervention group were very confident in determining injury causation (an increase in median score to 4 = “very confident”), whereas there was no change in median score in the usual practice group (median score of 3 = “moderately confident”). There was a statistically significant improvement in score in determining causation for the intervention group only. Seven individuals had an increase in score ( $p = 0.016$ ) in the intervention group compared to three individuals in the usual practice group ( $p = 0.125$ ).

**Table 2** Effect of intervention on change in knowledge and practice from pre to post

Outcome	Intervention		Sign test p-value	Usual practice		Sign test p-value
	+	-		+	-	
Knowledge <sup>a</sup>						
Knowledge on job demands	5	0	0.063	3	0	0.125
Knowledge on mechanism of injury	5	0	0.063	1	0	0.500
Practice <sup>b</sup>						
Communicate with employer	1	0	1.000	2	1	0.625
Tailor activity prescription forms	2	0	0.500	3	0	0.125
Explain mechanism of injury to patient	8	0	0.008	3	0	0.125
Determining causation	7	0	0.016	3	0	0.125

<sup>a</sup> Respondents were asked to score their responses on a 5 point-scale (1 = “strongly disagree”, 2 = “disagree”, 3 = “neither disagree nor agree”, 4 = “agree”, 5 = “strongly agree”)

<sup>b</sup> Respondents were asked to score their responses on a 4 point scale (1 = “not confident”, 2 = “somewhat confident”, 3 = “moderately confident”, 4 = “very confident”)

+ Number of participants for which score increased (improved) over time

- Number of participants for which score decreased (worsened) over time

Using the Cochran-Armitage exact test, there was no statistically significant difference in pre-post changes in providers’ knowledge and practices between the two groups (Table 3).

**Table 3** Differences in pre-post changes in knowledge and practice between groups

Outcome	Z	p-value
Knowledge <sup>a</sup>		
Knowledge on job demands	0.20	1.00
Knowledge on mechanism of injury	1.71	0.12
Practice <sup>b</sup>		
Communicate with employer	-0.05	1.00
Tailor activity prescription forms	0.22	1.00
Communicate with injured worker	1.52	0.18
Determining causation	1.85	0.10

<sup>a</sup> Respondents were asked to score their responses on a 5 point-scale (1 = “strongly disagree”, 2 = “disagree”, 3 = “neither disagree nor agree”, 4 = “agree”, 5 = “strongly agree”)

<sup>b</sup> Respondents were asked to score their responses on a 4 point scale (1 = “not confident”, 2 = “somewhat confident”, 3 = “moderately confident”, 4 = “very confident”)

In regards to general attitude questions, all nineteen participants (100%) responded yes to the statement that a job video could enhance their understanding of work tasks. Eighteen participants (95%) responded that a job video could help establish rapport with patients and increase patient buy-in for earlier RTW. Seventeen participants (89%) reported that it would be practical to incorporate a job video into the clinic visit. Sixteen participants (84%) reported that they would most likely watch the job video during the visit with the injured worker rather than before or after the visit. Fifty-eight percent of participants responded that a video of the injured worker versus a generic video about electricians would be most useful. Several participants stated in free text responses that information on frequency and duration of tasks and weights of objects used would be useful to incorporate into the job video.

## **Discussion**

In this study, we compared the effect on healthcare providers’ knowledge and RTW practices of reviewing a clinical case of an electrician with shoulder strain along with a job description to reviewing the case with both a job description and job video. Participants who additionally viewed a job video had increased confidence in determining whether an injury is related to work and explaining how the worker’s injury occurred, though these improvements in confidence were not statistically different compared to improvements in those that reviewed only the job description. Moreover, there were trends towards significance of providers’ knowledge on job demands and mechanism of injury in the group that additionally reviewed the job video. Nearly all participants indicated that job videos may be a useful addition in a clinical setting to improve patient rapport and increase buy-in for earlier RTW.

There was no statistically significant difference between pre and post intervention knowledge and practice for the usual practice group that only reviewed the job description. The use of job analyses in workers’ compensation RTW evaluations is a current standard under the Washington Administrative Code (WAC), and healthcare provider review of job analysis is a billable activity. [14,15] The type of job description used in this study is most likely to be representative of job descriptions available to healthcare providers within the first three visits in evaluation of an injured worker. The job description utilized in this study describes several essential tasks of an electrician (e.g., “modify, adjust, maintain, and repair or install ...electric equipment”) but did not break down the essential tasks by physical demands, such as how often an electrician is typically required to lift, reach, or perform overhead work. Such detailed breakdowns are often found in job analysis documents compiled by vocational rehabilitation providers. [16,17] We did not design our study to compare the review of a clinical case with a job description alone to a job video alone because current WA administrative processes already incorporate a written account of the job. However, our results suggest that review of written job descriptions alone may not provide added value to medical provider knowledge about a job or RTW practices.

One potential reason that review of job descriptions alone may not generally provide added value to the medical provider is that although Washington LNI does provide an example of job description downloadable for employers to utilize, they do not mandate that job descriptions be standardized. The WA LNI job description template includes information about specific physical motions and frequency

required for the job and is prepared by the employer.[18,19] The WA LNI job description template looks much like an abbreviated job analysis form, and in theory would provide valuable information to help healthcare providers understand the job of injury and physical work demands. In reality, however, healthcare providers often receive job descriptions that are usually prepared by human resources departments and that do not include specific information about physical demands and frequency of movements required for the job.

Unlike the job description, job analyses are completed by licensed vocational counselors and include detailed information on tools and equipment required to do a job, the physical demands and frequency required to perform essential functions of a job, and potential environmental hazards.[14] Job analysis forms are helpful resources for healthcare providers but take time to compile and are often not readily available within the first three visits of an injured worker. Job analyses are typically prepared after an injured worker has been off the job of injury for a prolonged period and in the setting of transitioning a worker to an alternate position. It is possible that our usual practice results would have been different if we used a job analysis rather than a job description. Future studies could compare reviewing a clinical case with a job analysis versus a job video versus a standardized job description.

Although providers in the intervention group demonstrated increased confidence in determining injury causation and explaining the mechanism of injury to the patient, there was no statistically significant difference in pre-post score differences between groups. The lack of observed difference may be due to the small sample size of the study. The lack of statistical significance may also have been observed because the job video was not fully optimized. The 30 second video clip of three specific tasks most likely to be associated with shoulder injuries was developed to be most practical and efficient for participating providers in a busy clinical setting. The 30s clip only captured a worker performing a task at a single point in time and did not provide information on frequency or duration of these tasks. Several participants indicated that the frequency and duration of overhead work would have been helpful complementary information for this clinical case. It is possible that future videos could include narration of such details while remaining brief or could be slightly longer and include more tasks and more complete narration of physical demands. If integrating a longer, more comprehensive job video into the clinical workflow is not practical, it is important to note that a brief video could still serve as a starting point for discussion of mechanism of injury and modified duty between the healthcare provider and patient.

Another potential reason for the observed lack of significant difference pre-post knowledge and RTW practice improvement between the groups is the comprehensive clinical case description that was provided to both groups. If the clinical case provided fewer details, the job video may have added more information and resulted in a greater difference. The effect of how much a job description or job video may have on healthcare providers' knowledge and practices is likely dependent on the type of patient history solicited by individual providers. Some providers are more experienced than others in eliciting a thorough history. More experienced providers may also already have deeper knowledge about different jobs, and additional information from the job description or job video may contribute less to how they manage the patient. The majority of providers evaluated in this study had greater than 10 years of experience in occupational medicine. There may have been a greater observed effect of the job video if the study was performed with a less experienced cohort that had managed fewer similar cases.

Participants in this study were not only relatively experienced, but they were also recruited from within the WA COHE network. Providers within the COHE system have access to COHE health services coordinators, COHE advisors and specialists, and training in occupational health best practices.[20, 21] These providers may already have a strong background in the RTW process from trainings, whereas providers who do not practice within a COHE system may be less familiar with taking a thorough occupational history, writing specific work modifications, and communicating with the employer. Providers in this study already had high median scores on certain knowledge and practice questions before exposure to the module. Yet, the majority of workers' compensation patients are evaluated by community providers who do not receive regular training on RTW best practices.[22] If this study focused on community rather than COHE providers, there may have been a greater difference observed in pre and post knowledge and practice.

In the qualitative analyses, frequent comments included "pictures are worth 1000 words" and emphasis that job videos could really help build a stronger relationship with the patient. Job videos may help healthcare providers unearth important parts of the patient history that are better illustrated visually. Moreover, comments suggest that job videos may improve the doctor-patient relationship. The doctor-patient relationship is complex and has changed historically from a prescriptive, paternalistic relationship to a therapeutic alliance that values patient-centered care and shared decision-making.[23]

Previous studies on doctor-patient communication have shown that not only do physicians who establish a partnership relationship with patients have improved patient satisfaction, recall and understanding of information, and improve health outcomes.[24] Several participants in this study reported that the job video could serve to build rapport with the patient because it promotes trust and builds confidence in the provider. This is impactful because it suggests that job videos offer the opportunity to change the traditional prescriptive, one-sided doctor-patient relationship to one that values a more interactive, patient-participatory approach to care. Partnering with patients throughout the healing process is important not only for physical rehabilitation but also for motivating injured workers to return to work in a safe and timely manner to prevent long-term work disability.[24]

Although not mentioned by participants in this study, a job video can serve as a powerful communication tool for limited English proficient patients. Studies have shown that limited English speakers in the workers' compensation system have greater difficulty in the RTW process, partly due to misunderstandings with employers and communication barriers with healthcare providers.[25] A job video even without narrative detail can provide much visual-spatial information about job tasks, which can help healthcare providers better understand work situations of non-English speaking patients. This can alleviate the need for injured workers to provide extensive explanations, which can be frustrating and difficult for the non-English speaker and decrease the likelihood of misunderstandings and loss of information when interpreters are part of the clinical visit.

### **Strengths and Limitations**

This study has several strengths, including its randomized design and collection of both quantitative and qualitative, hypothesis-generating, data. This study demonstrated the feasibility of evaluating job videos for future larger studies.

The study also has several limitations, including the use of a non-validated survey instrument and small sample size with limited demographic variability of providers. Recruitment was via email to the COHE network providers, which may have introduced selection bias and resulted in lack of capture of the broader occupational healthcare provider network. For example, the study did not include orthopedic surgeons, who treat a large number of workers' compensation patients with musculoskeletal injuries and diseases.

Though providers were randomized, the study was small and groups were not fully balanced, for example by COHE. Two WA COHEs are regional and work with multiple health systems within a geographical region, while the other three included in this study are institutional and are operated by large medical systems that exclusively work with providers within their own systems.[26] Some COHEs have health services coordinators available to assist with RTW issues during the clinic visit with the provider, in office near the clinic, or over the phone. The proximity of COHE health service coordinators to occupational healthcare providers and direct availability to the patient may result in some differences in occupational health providers' willingness to discuss RTW processes with the patient and the employer and affect how involved a provider is in the RTW process. In some practices, the health services coordinators may be the point of contact with the employer and occupational healthcare providers may not be involved in communications with the employer. This study was not large enough to analyze the differences between participants in different COHEs. Finally, the study may not be generalizable beyond the Washington state COHE system, which does not exist in other US States.

### **Conclusions**

In this study of Washington state occupational healthcare providers, participants who additionally viewed a job video had increased confidence in determining whether an injury is related to work and explaining how the worker's injury occurred, though differences between the groups were not statistically significant. Although job videos may be a useful addition in a clinical setting to enhance certain providers' understanding of work tasks and establish better patient rapport, further work is needed to determine how job videos might be incorporated into the clinical workflow to improve outcomes. Larger studies are also needed to further examine differences in outcomes between providers that integrate job videos into their practice compared to those who do not. Future studies are also needed to assess patient perspectives on the use of job videos in the clinical visit.

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## **Appendix 1. Clinical Scenario**

A 45 year old right handed male electrician presents with right shoulder pain.

He reports gradual onset of a dull, achy pain located deep in his shoulder joint. His pain has worsened over the past month. He did not recall a specific traumatic incident associated with the onset of pain. There was no acute swelling or bruising of his shoulder or surrounding regions.

He has started to notice some right arm weakness and soreness. The pain is worse when lifting items or working with his arms above his shoulders. He is also noticing pain at rest, especially during sleep.

He has no prior history of shoulder pain or injuries. He does not play any intensive sports or have any other hobbies that involve extensive use of his upper extremities.

He states that his job duties include installing and maintaining electrical and power systems for new high-rise building construction sites. He is often involved in installing electrical circuits. He also works on some interior and exterior lighting installations, equipment, and appliances.

He frequently uses screwdrivers, drills, and power tools. He also frequently pulls wires and cables.

After physical examination, you determine that the patient has right shoulder strain.

## **Appendix 2. Job Description for Electrician**

Adapted from: <https://hr.uw.edu/files/comp/jobspecs/18834.php>

### DEFINITION

Perform journey-level electrical work.

### DISTINGUISHING CHARACTERISTICS

Positions allocated to this class are distinguished by the responsibility to perform journey - level electrical work in the maintenance, repair, and construction of institution facilities on 750 volt system, or less.

### TYPICAL WORK

Alter, maintain, repair or install wiring, cables, switches, controls, fuse boxes, breaker panels, instrument panels, distribution panels, buzzer and bell circuits, power circuits and communications circuits; may construct new facilities from blueprints and specifications;

Modify, adjust, maintain, repair or install electric motors, electrical equipment, instruments such as pumps, clocks, lamps, stoves, electrical meters, timers, fans, air conditioners, refrigerators, power tools and motors;

Rewind coils and armatures; refinish commutators; replace and reseed brushes; replace work out bearings and other motor and generator parts;

Inspect electrical systems, communications systems and equipment to detect and correct faulty components or parts;

Inspect and maintain high voltage power transmission systems including wires, poles, transformers carrying 750 voltage, or less;

Perform alterations, adjustment, modification, repair and installation of electrical equipment systems;

Develop preliminary cost estimates for installations and repairs;

Drive service truck as required; load and unload materials and supplies;

May lead and instruct helpers as required;

May perform work in other trades;

Perform related duties as required.

### **Appendix 3. Job Video**

Available at: [https://youtu.be/\\_Ky\\_4CXRSEQ](https://youtu.be/_Ky_4CXRSEQ)

### **Appendix 4. Survey Questions**

#### Eligibility

1. Are you currently an occupational healthcare provider in Washington State with at least one year of experience in occupational medicine?
  - a) Yes
  - b) No
2. Do you practice as part of a Centers of Occupational Health and Education (COHE)?
  - a) Yes
  - b) No
3. Which COHE is your practice associated with? (Multiple answers can be selected.)
  - a) COHE at UW Medicine Valley Medical Center
  - b) COHE Community of Eastern Washington
  - c) COHE at The Everett Clinic
  - d) COHE Alliance of Western Washington
  - e) COHE at Kaiser Permanente

#### Consent to Participate

In this survey, you will be presented with a clinical scenario and asked to answer approximately 30 questions. Total time expected to complete the survey is 15 minutes. A stable internet connection and browser access is required.

All survey responses are confidential. We will keep data in a secure electronic file on password protected computers and in locked offices only accessible to the researchers involved with this project. Only summary survey data will be shared outside of the research team. Although answers to individual survey questions are required, you can choose not to participate in any part of the study, including the surveys, at any time.

This a pilot study that is part of a Master's Thesis. I/the study research graduate student, Jessica Chuang, telephone (626) 233 7475, e-mail [chuangj3@uw.edu](mailto:chuangj3@uw.edu), can answer any questions you may have about the study.

Would you like to participate?

By clicking "yes" and "next" you are confirming the following:

- 1) You are volunteering to take part in this research
- 2) You have had a chance to ask questions
- 3) If you have questions later about the research, you can ask the researchers listed above
- 4) If you have questions about your rights as a research subject, you can call the Human Subjects Division at (206) 543-0098

1. Would you like to participate?
  - a) Yes
  - b) No

Pre-Intervention

1. I feel I understand the mechanism leading to the patient's current symptoms.
  - a) Strongly disagree
  - b) Disagree
  - c) Neither disagree nor agree
  - d) Agree
  - e) Strongly agree
2. I feel I understand the patient's physical demands at work.
  - a) Strongly disagree
  - b) Disagree
  - c) Neither disagree nor agree
  - d) Agree
  - e) Strongly agree
3. Given the information provided, how confident are you in your ability to make a determination about work-relatedness?
  - a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
4. Given the information provided, how confident are you in your ability to answer the patient's questions about the mechanism of injury?
  - a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
5. How confident are you in your ability to tailor your restrictions or limitations on the activity prescription form to this occupation?
  - a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
6. How confident are you in discussing modified/light duty possibilities with supervisor/employer?
  - a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
7. How often do you typically communicate with an injured worker, such as the one described in the scenario, within the first month after their injury?
  - a) Daily
  - b) Twice a week

- c) Weekly
  - d) Every two weeks
  - e) Once a month
  - f) Not at all
8. How often do you typically communicate with the employer, for example of the patient described in the scenario, within the first month after the patient's injury?
- a) Daily
  - b) Twice a week
  - c) Weekly
  - d) Every two weeks
  - e) Once a month
  - f) Not at all
9. What resources do you typically use to learn more about workers' job tasks? (Multiple answers can be selected.)
- a) Internet search
  - b) Job description
  - c) Job analysis
  - d) Communication with the supervisor/employer
  - e) Other
10. Have you personally been an electrician or performed electrical work or have a close family member or friend who is an electrician?
- a) Yes
  - b) no
11. Do you frequently treat workers who were electricians? (more than 25% of your practice?)
- a) Yes
  - b) no
12. What is your clinical degree?
- a) Medicine and Surgery (MD)
  - b) Osteopathic Medicine (DO)
  - c) Physician's Assistant (PA)
  - d) Advanced Registered Nurse Practitioner (ARNP)
13. How many workers compensation patients do you typically see in your current practice in a week?
- a) < 4
  - b) 4-8
  - c) 9-16
  - d) 17-24
  - e)  $\geq 25$
14. How many years have you practiced occupational medicine (not including your clinical training)?
- a) 1-3 years
  - b) 4-5 years
  - c) 5-10 years
  - d) 10+ years

15. What specialty is your board certification? (Multiple answers can be selected.)
- a) Occupational Medicine
  - b) Internal Medicine
  - c) Family Medicine
  - d) Emergency Medicine
  - e) other
16. What is your sex?
- a) Male
  - b) Female
  - c) other/prefer not to answer
17. What is your age?
- a) < 35
  - b) 35-45
  - c) 46-55
  - d) 55
  - e) Prefer not to answer

*Intervention* → watch job video or read job description

Post-intervention

18. I feel I understand the mechanism leading to the patient's current symptoms.
- a) Strongly disagree
  - b) Disagree
  - c) Neither disagree nor agree
  - d) Agree
  - e) Strongly agree
19. I feel I understand the patient's physical demands at work.
- a) Strongly disagree
  - b) Disagree
  - c) Neither disagree nor agree
  - d) Agree
  - e) Strongly agree
20. Given the information provided, how confident are you in your ability to make a determination about work-relatedness?
- a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
21. Given the information provided, how confident are you in your ability to answer the patient's questions about the mechanism of injury?
- a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident

22. How confident are you in your ability to tailor your restrictions or limitations on the activity prescription form to this occupation?
- a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
23. How confident are you in discussing modified/light duty possibilities with supervisor/employer?
- a) Not very confident
  - b) Somewhat confident
  - c) Moderately confident
  - d) Very confident
24. For new patients, how frequently are you provided a job description on the first visit?
- a) Less than 50% of the time
  - b) About 50% of the time
  - c) More than 50% of the time
  - d) Almost 100% of the time
25. For new patients, how frequently do you review the job description if provided one?
- a) Less than 50% of the time
  - b) About 50% of the time
  - c) More than 50% of the time
  - d) Almost 100% of the time

→ *For those who read the job description, they will now watch the job video.*

26. Do you think that a job video (versus job description) could provide valuable information that would enhance your understanding of a patient's work tasks?
- a) Yes (if yes, how)
  - b) No (if no, why not)
  - c) Comments
27. Do you think reviewing a job video with the patient present would help in establishing rapport with the patient?
- a) Yes (if yes, how)
  - b) No (if no, why not)
  - c) Comments
28. Do you think reviewing a job video during the clinic visit would help increase buy in for the patient to return to work on modified duty earlier?
- a) Yes
  - b) No
  - c) Comments
29. How practical do you think it would be to incorporate a job video into the clinic visit for each patient you see?
- a) Not at all practical
  - b) Neutral
  - c) Somewhat practical
  - d) Very practical

- e) Comments
30. If you were to watch a job video as part of a clinical evaluation, when would you most likely watch the video?
- a) During the visit with the patient
  - b) Prior to the patient encounter
  - c) After the patient encounter
  - d) I would not watch a video
  - e) Comments
31. What format of a job video do you think would be most useful, and why?
- a) Generic video of the patient's occupation
  - b) Video taken of the patient performing the job tasks
  - c) Video taken by the patient of another co-worker performing the same job tasks
  - d) Comments? Why?
32. What additional information do you think would be helpful to include in a job video? Free text