



## Impact of job characteristics on return-to-work interval following arthroscopic partial meniscectomy

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The aim of this paper was to investigate whether job characteristics are associated with time interval for return to former professional activity (return to work, RTW) after arthroscopic partial meniscectomy (APM). A retrospective study was carried out in a sample of 63 patients in working age who underwent an APM between July 2018 and July 2020. The following preoperative characteristics were assessed: age at surgery, meniscal side, sex, physical job demands (white versus blue collar worker), telework and work status (salaried versus self-employed). A linear regression analysis was used to study the association between job characteristics and RTW interval adjusted for socio-demographic and medical (meniscal side) factors. Telework was most strongly associated with interval for RTW ( $p < 0,001$ , adjusted R Square: 20,8). The results suggested that telework supports early RTW independently of sociodemographic and medical factors. This study supported the need for a tailor-made approach in the prescription of sick leave.

**Keywords:** return to work; sick leave; telework; job characteristics; arthroscopic meniscectomy.

### INTRODUCTION

APM is one of the most popular and most commonly performed orthopaedic surgical pro-

cedures worldwide (1, 2). Knee arthroscopy is considered a minimally invasive, reliable and cost effective procedure with high patient acceptance (3, 4).

Meniscus lesions are a highly frequent problem in orthopaedic patients with knee pain. They can be degenerative or traumatic. Different treatment options evolved over time with APM as gold standard for many years (5). Tendency to meniscal saving approach gains popularity because meniscectomy is a risk factor for developing degenerative knee osteoarthritis. The amount of removed meniscus is the most important predictor factor (5, 6, 7).

Studies showed that several factors negatively affect the postoperative course. The degree of pre-

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*Compliance with ethical standards.*

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existing osteoarthritis was an important determinant (5, 8). Also age, sex, anterior cruciate ligament (ACL) deficiency, meniscal side and others could play a role in the rehabilitation (7). Use of a tourniquet did not seem to adversely affect outcome after knee arthroscopy (9).

Literature reports often studied return to sport after APM as meniscal tears mostly occur in young, active patients (10, 11). But it is also vitally important to understand time to recover and resume work in this patient population. This knowledge may be relevant in determining duration of sick leave and in setting realistic expectations for patients. A few studies reported RTW interval between 1-3 weeks (12, 13, 14). Pre-injury activity levels after APM recently were reported to be reached after 3-4 weeks (8).

Previous studies on predictors of return to work after knee arthroscopy are scarce. Only few studies so far investigated the relationship between telework and RTW in general (15, 16).

To the best of our knowledge, no Belgian study has yet investigated whether job characteristics are related to time to return to work after APM. Therefore, the main aim of this paper was to analyze whether job related features are associated with time off work following APM. We hypothesized that (temporary) telework would be associated with early return to previous work, independent of socio-demographic and medical variables. A second objective was to compare sick leave data with international (French) guidelines.

## METHODS

This study was approved by the ethical committee of the Catholic University of Leuven.

We started with a group of 205 patients who were operated performing an APM for torn meniscus (Fig. 1). For the purpose of this study we included only subjects in the working age category (25-60 years). Patients in their last years before retirement were not taken into account because of a possible trend of seizing the operation to bridge until full retirement. Clinical diagnosis was if necessary substantiated by magnetic resonance imaging (MRI) as MRI has proven to be a valuable tool in diagnosis of torn meniscus and surgical decision making (17).

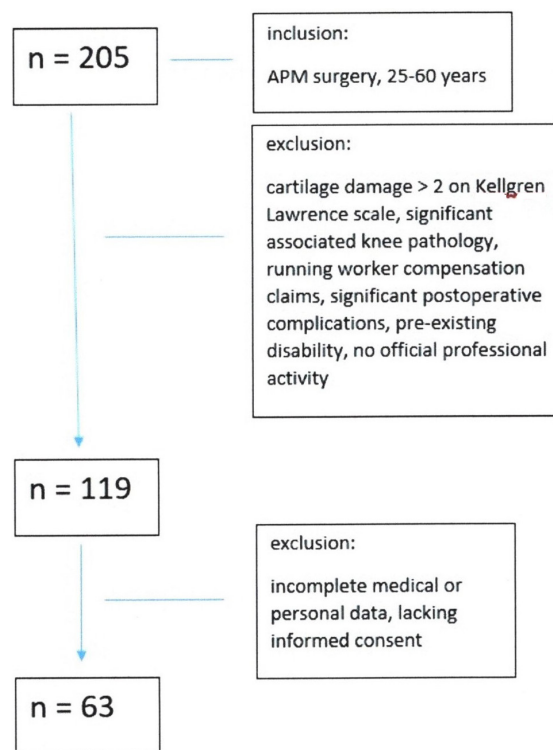


Figure 1. — Flow chart patient selection.

Diagnosis was confirmed during arthroscopy. All surgeries were done in the same hospital by a single knee surgeon (second author) in the period between July 2018 and July 2020. A 4 week period of sick leave was attested after surgery with a clinical re-evaluation 2 weeks postoperatively.

Possible confounders were reduced to minimum. To exclude the negative consequences of degenerative osteoarthritis on RTW a maximum grade 2 cartilage damage on Kellgren Lawrence scale was applied (18). Also other relevant associated lesions like ACL deficiency or laxity were excluded. One patient was withdrawn because of prolonged rehabilitation after deep venous thrombosis. Patients with worker compensation claims (e.g. work accidents) were also excluded because of possible secondary gain (8). 18 more patients were excluded because of different reasons: 8 already had preoperative sick leave for other reasons, 6 had prolonged disability due to other medical comorbidities and 4 were housewife with no official professional activities. Of the original 205 included patients, a total of 119 were eligible for this study.

Following data were retrospectively collected from each patients' hospital health file: operation side, degree of degenerative arthritis, age, sex, return to work interval in days, job description with subdivisions blue collar and white collar worker, job status in terms of self-employed versus salaried employee, the availability of telework, surgical complications. Missing relevant information was questioned by telephone. In non-teleworkers estimated RTW interval – if available telework option – was telephonically questioned. Data on physiotherapy were largely lacking and not taken into account.

Due to incomplete medical or personal data set or lacking informed consent 56 patients were additionally removed from the study population. Eventually 63 patients were retained.

Belgium applies a compulsory social security system. Sickness allowance for salaried employees begins after the guaranteed salary period during 1 month of disability fully paid by the employer (clerk) and partly by employer and sickness fund (laborer). After that period, employees receive a maximum of 60% of their capped gross salary paid by the sickness fund. Self-employed workers are entitled to a lump sum work incapacity allowance (40 to 60 euro a day) from the first day of incapacity if the incapacity lasts more than 7 days.

We defined sick leave as time off from previous employment. Telework was defined as a work arrangement that allowed patients to perform the same or alternative work at home. The kind of job patients performed before APM was classified based on job title following the Dictionary of

Occupational Titles (DOT) into sedentary or light (white collar worker) and medium or (very) heavy work (blue collar worker) (19).

Statistics were performed using IBM SPSS Statistics 27 for windows. The Kruskal-Wallis test, a rank based nonparametric test, was used for univariate analysis to investigate sick leave in 3 major work characteristics: teleworkers compared to non-teleworkers, self-employed people to salaried workers and white compared to blue collar workers. A p value <0,050 was considered statistically significant. Multivariate analysis to examine telework as an independent associated factor of sick leave was conducted by a stepwise linear regression test. A One-Sample Wilcoxon Signed Rank Test was implemented to compare our time off work data by occupational strength level with French guidelines from the Haute Autorité de Santé (HAS).

## RESULTS

Table I shows baseline characteristics of the participants. The mean age of the total sample was 45 years (standard deviation (SD) = 9,19). The majority of the patients were male (70 %), salaried (92%) and blue collar workers (70 %). The medial meniscus was affected in 81% of the patients. 16% of the white collar workers had the possibility of telework.

All patients returned to their previous employment with a mean sick leave of 31 days (median was 28). Table I and figure 2 show the association between job characteristics and time off work. Telework, white collar and self-employment were significantly associated with early return to work ( $p \leq 0,001$ ).

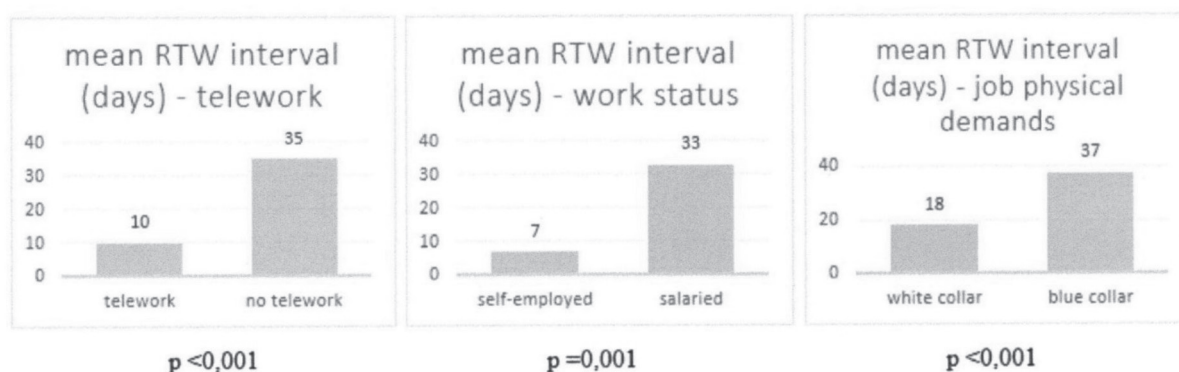


Figure 2. — Mean RTW interval in days based on job characteristics.

Table I. — Characteristics of the study population

Variable	n = 63	RTW interval (days)		p-value
		mean	median	
telework	10 (16%)	10 (CI: 1,79 - 18,41)	3,5	< 0,001*
no telework	53 (84%)	35 (CI: 30,13 - 40,24)	28	
blue collar	44 (70%)	37 (CI: 31,03 - 42,83)	35	< 0,001*
white collar	19 (30%)	18 (CI: 11,69 - 24,21)	24	
self-employed	5 (8%)	7 (CI: -3,81 - 17,01)	2	0,001*
not self-employed (salaried)	58 (92%)	33 (CI: 28,35 - 38,31)	28	
female	19 (30%)	28 (CI: 21,84 - 34,79)	28	0,466*
male	44 (70%)	32 (CI: 25,81 - 39,10)	31	
medial	51 (81%)	33 (CI: 28,02 - 38,89)	28	0,039*
lateral	9 (14%)	27 (CI: 12,48 - 41,74)	28	
medial + lateral	3 (5%)	5 (CI: -1,84 - 12,50)	7	

Legend: CI = 95% Confidence Interval ; \* KruskalWallis test

Table II. — Medical disability of study subjects compared to corresponding data from HAS, France

HAS	days off work	results	days off work	p-value $\diamond$
sedentary work	10	white collar	24	0,023
light physical activities	14			0,045
moderate physical activities	21	blue collar	35	< 0,001
heavy physical activities	45			0,008

Legend: HAS = Haute Autorité de Santé;  $\diamond$  One-Sample Wilcoxon Signed Rank Test

Self-employed patients had the lowest sick leave with 7 days (95% CI : -3,81-17,01), followed by telework (mean 10 days, 95% CI: 1,79-18,41) and white collar work (mean 18 days, 95% CI: 11,69-24,21).

Bicompartimental surgery had a significant influence on sick leave duration ( $p=0,039$ ) in contrast to the side of operation in unicompartimental surgery.

Multivariate analysis showed telework as the only independent significant variable related to faster return to work. This model explained 22 % of the variance ( $R^2 = 22,1$ ). Mean RTW interval appeared to be 3,5 times longer when the option of telework

was not offered. 24 non-teleworkers (45% of the non-teleworking group) judged that with the option of telework their RTW interval would have been shorter.

The HAS in France divided jobs in 4 categories according to physical demands: sedentary work and light, moderate and heavy physical activities (20). For the purpose of this study we distinguished white versus blue collar workers. White collar jobs match sedentary work and light physical activities. Blue collar jobs match moderate and heavy physical activities. Median disability duration of these 2 groups was compared with the French results.

Benchmarking our data against the official French disability duration guidelines showed that sick leave was substantially higher among Belgian white collar workers. However, blue collar sick leave duration fairly complied with the recommended official return to work times (Table II).

## DISCUSSION

Few studies addressed RTW interval depending on job characteristics. Our study showed that teleworkers, white collar workers and self-employed people have a statistically significant ( $p < 0,050$ ) faster return to work than their counterparts. In addition, telework supported early RTW independently of sociodemographic and medical factors.

Literature reported having a job as vital for a good health status (21). RTW is important in patients' postoperative health status due to its influence on patient's independence, financial well-being and daily activities (22). Giving correct and realistic expectations about absenteeism and functional outcome had a positive effect on job reintegration (23). In daily practice sick leave duration is prescribed too often without any second thought. The certificate is mostly written before knowing the actual postoperative evolution and without consideration neither of the content of patients' job nor the possible temporary job accommodations. Sick leave duration is a relative term and has to be prescribed case dependent. It can be legitimate due to someone's lack of capacity to work, due to a lack of motivation or when RTW is a risk for the personal or the others' health status. In this study we aimed to explore RTW interval after a standardised surgery (APM) by focusing on job related predictors such as job content (blue versus white collar, physical demands of work) and telework opportunities both related to capacity and work status (salaried or self-employed) as a proxy for motivation to work (financial, ideological).

Mean RTW interval for the different subgroups of patients didn't exceed 6 weeks. Our results were in line with those of Lubowitz et al. (2001) who showed that 4 weeks after knee arthroscopy all patients could resume light activities and 62% could return to activity with no restrictions for

knee-related reasons (3). We found that white collar workers can on average resume work after 3 weeks. These results corroborate those of Umar et al. (1997) who showed in a study of 188 knees that the majority of sedentary workers (53%) was able to return to work at a mean time of 3 weeks (14). Such results demonstrated the importance of taking job characteristics in account.

There is a paucity of literature dealing with return to work guidelines following APM. The Royal College of Surgeons of England (RCS) has an insightful, well-structured leaflet with guidelines on recovery (24). Fitness to work is approached as a gradual process. A couple of hours of administrative work from home should be possible 4-6 days postoperatively. After 1-2 weeks light work activities in a reduced number of hours should merit consideration. 2-4 weeks postoperatively patients with white collar jobs could resume full-time work. For workers with heavy manual work, a lot of physical exertion or specific safety considerations 4 weeks or longer may be necessary. If RTW lasts longer than 6 weeks following a complication-free procedure, physicians should be aware of intervening factors such as anxiety and lack of confidence.

RTW guidelines from The Melbourne hip and knee clinic suggest 1 week sick leave for desk jobs, 2 weeks for more ambulatory jobs and at least 4 weeks for physically demanding work (25).

'Working fit', a British independent occupational medicine consultancy, suggests following terms for sick leave: 1-2 weeks for sedentary light jobs, 2-4 weeks for light manual work, 2-6 weeks for heavy manual work and 4-6 weeks for physically demanding work (26).

The HAS guidelines on RTW after APM recommend 10, 14, 21 and 45 days time off from work in case of sedentary, light, moderate and heavy levels of work respectively (20) (Table II).

In this study, telework was the strongest factor associated with early RTW after adjustment for physical demands of work and employment status. A driving reaction simulator study showed that after knee arthroscopy it was appropriate to delay return to driving for at least 1 week up to 4 weeks depending on the postoperative evolution (27).

Telework can remedy driving impairment unless driving was an essential part of the job. Not a single blue collar worker in our study had the option of telework which is in line of expectation with the type of jobs for which telework is considered a realistic option.

Spontaneous anecdotes during telephone interview learned that one patient restarted work after only two days and was convinced this was only possible because of telework. A blue collar worker was offered a temporary adaptation in her daily function corresponding to a lighter job (comparable to telework) what made her restart earlier. The importance of tailor-made prescription of sick leave was illustrated by an information technology (IT) specialist (white collar – telework – salaried employee) admitting he could have resumed work after 3 days but seized the opportunity of the prescribed sick leave.

We found that self-employment and white collar work were predictive for faster RTW. These findings were in agreement with recent study results on RTW interval after joint arthroplasty (22).

Strengths of the study included a clearly defined patient population without concomitant severe osteoarthritis or associated lesions such as ligament deficiency, factors associated with worse clinical outcome following APM (5, 8). Second, the participants were recruited from a single surgeon excluding performance bias. Third, telework stands out as very relevant topic in work organization reinforced by actual COVID-19 pandemic context.

This study had several limitations. First, the present retrospective study with administrative data resulted in data gaps on individual patients regarding preoperative and postoperative clinical manifestations and did not allow us to identify postoperative physiotherapy and leg dominance in terms of preoperative muscle strength. The role of physiotherapy was exemplified by St-Pierre et al. who stated that the value of physiotherapy depends on the presence of preoperative strength deficits. In this point of view physiotherapy was reserved for professional athletes to resume sport faster (13). Second, our investigation relied on participants' reports of past information on medical course and RTW by telephone, making data prone to recall

biases. Inaccurate recollection of events was minimized by asking just a few simple questions over a recent time period. In case of doubt, patients were called a second time. Third, we only had information on the job physical demands by job title (blue collar versus white collar worker) but not on validated occupational strength levels. Querying patient's own opinion about strength demands of work partially overcame this limitation. Fourth, the sample size was relatively small resulting in low statistical power.

The impact of telework on RTW following APM has several implications for future research and work organization. Telework offers many advantages for both employee and employer including autonomy, savings on travel costs, increased productivity and infrastructure cost reduction. Our research appears to confirm that (transitional) telework has potency to return patients swiftly to previous employment following meniscal surgery. Further prospective observational investigations with larger samples are needed to confirm our findings and to explore its relevance in the recovery following diseases other than meniscal tear. Randomized controlled trials could further strengthen the possibility of a causal relationship between (transitional) telework and a faster return to previous sedentary or heavy work. Telework may show promise as a new tool for governments to combat rising disability claims.

## CONCLUSION

The mean sick leave following APM for blue and white collar workers was respectively 37 and 18 days. Telework and self-employed were associated with a substantial reduction in time off work to 10 and 7 days respectively. After adjustment for socio-demographic and medical variables, only telework explained significantly 22% of the variance in sick leave.

This study supported the need for a tailor-made approach in the prescription of sick leave.

International guidelines on RTW interval covering job characteristics provide a useful tool for both prescribers and patients.

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