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Defining Factors Related to Failure of Medial Meniscus Posterior Root Repair

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Faculty Disclosure Information

- **CONMED Linvatec**
- **Johnson & Johnson**
- **Link Orthopaedics**
- **Procter & Gamble**
- **Regenera AMT**
- **Smith & Nephew**
- **VSY**



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INTRODUCTION

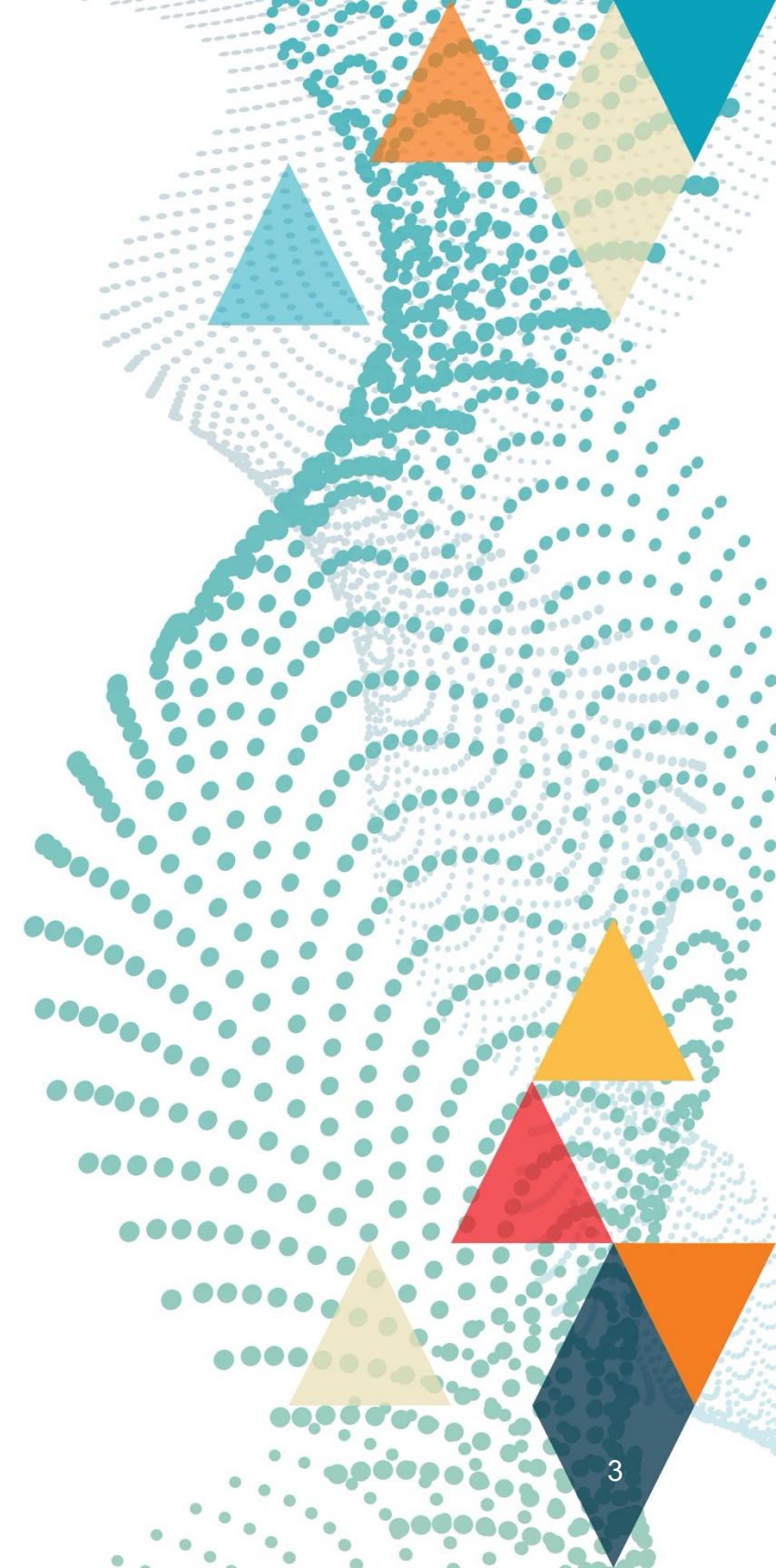
- **Meniscus root tears have recently gained significant attention.**
- **Lateral meniscus posterior root tears are usually associated with traumatic knee ligament injuries, and their repair has been shown to improve anterolateral rotational instability.**
- **In contrast, medial meniscus posterior root tears are, in the vast majority of cases, linked to degenerative changes in the knee.**



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INTRODUCTION

- If left untreated, they may contribute to the progression of medial compartment osteoarthritis or even lead to subchondral fractures.
- However, factors associated with poor prognosis following medial meniscus posterior root repair remain unclear in the current literature.



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OBJECTIVE

The objective of the study was to evaluate the risk factors for failure of medial meniscus posterior root repair, including the patient's preoperative factors, factors related to surgery and rehabilitation, already excluding most of the known factors of failure such as uncorrected varus axis deviation and advanced degenerative changes in the medial compartment.

METHODS

- Patients of any age submitted to medial meniscus posterior root repair through a transtibial tunnel with a minimum 2-year follow-up were included.
- The following parameters were collected: age, sex, BMI, time from injury to surgery, previous knee surgery, associated procedures, Kellgren-Lawrence and Outerbridge classifications, number of sutures and tunnels, fixation method, patient's compliance with rehabilitation, and postoperative IKDC, Lysholm, Forgotten Joint Score (FJS) and Global Perceived Effect (GPE) and meniscus root repair failure.



RESULTS

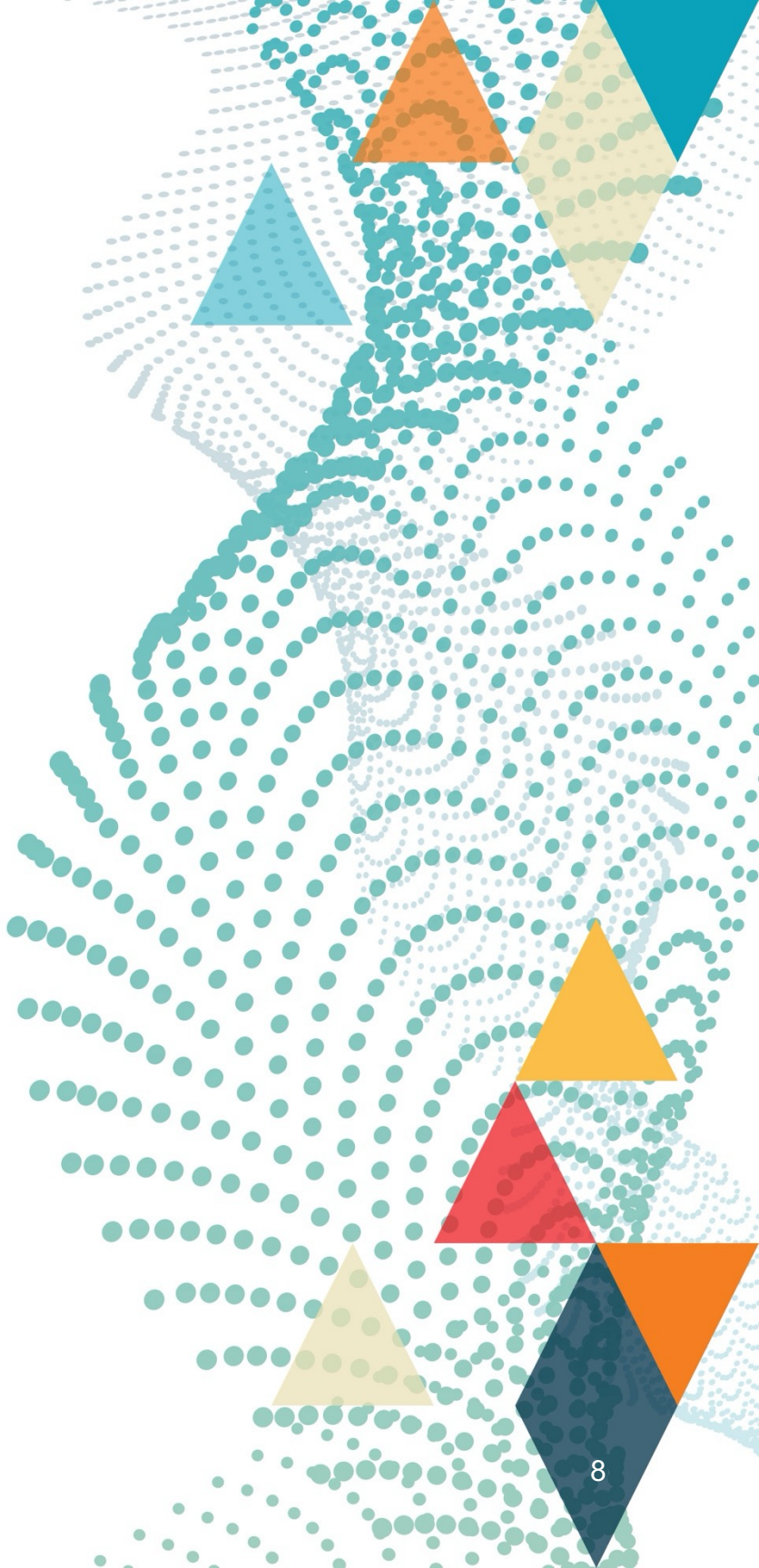
One hundred and fifty-four patients were evaluated.

Thirty-five (22.7%) were considered failures.

According to the univariate analysis, patients who were considered repair failure presented a higher proportion of female patients ($p=0.001$), higher BMI ($p=0.001$), greater degree of femoral ($p<0.001$) and tibial ($p=0.018$) chondral injuries, repair with a single femoral tunnel ($p=0.043$) and worse compliance with rehabilitation ($p<0.001$).

Table 1. Demographic characteristics, preoperative and surgery-related data of patients who underwent medial meniscus posterior root repair.

	N=154
Age (mean ± SD; years)	50.2 ± 9.5
Sex	Female - 77 (50%) Male - 77 (50%)
BMI (Kg/m ²)	27.8 ± 4.3
Time from injury to surgery (months)	3.2 ± 1.9
Follow up time (months)	48.8 ± 18
Previous surgery on the operated knee	No - 121 (78.6%) Yes - 33 (21.4%)
Simultaneous associated procedure on the operated knee	No - 140 (90.9%) Yes - 14 (9.1%)
Preoperative Kellgren-Lawrence grading	0 - 66 (42.9%) 1 - 65 (42.2%) 2 - 23 (14.9%)
Femoral chondral injury (Outerbridge classification)	0 - 52 (33.8%) 1 - 61 (39.6%) 2 - 41 (26.6%)
Tibial chondral injury (Outerbridge classification)	0 - 55 (35.7%) 1 - 89 (57.8%) 2 - 10 (6,5%)
Number of sutures used for meniscus root repair	2 - 90 (58.4%) 3 - 64 (41.6%)
Type of suture	High-strength suture - 125 (81.2%) Suture tape - 29 (18.8%)
Number of bone tunnels	1 - 122 (79.2%) 2 - 32 (20.8%)
Fixation method	Cortical button - 129 (83.8%) Suture anchor – 25 (16.2%)



RESULTS

- **Patients with repair failure also showed worse results on all functional scales evaluated, including IKDC ($p<0.001$), Lysholm ($p<0.001$), FJS ($p<0.001$), and GPE ($p<0.001$).**
- **Multivariate analysis has shown that regardless of the other characteristics evaluated, female patients, increased BMI, femoral chondral lesions, and the patients who did not follow compliance with rehabilitation had an increased chance of repair failure.**

Table 2. Postoperative data and postoperative functional scores of patients who underwent medial meniscus posterior root repair.

	N=154
IKDC subjective score	63.9 ± 18.9
Lysholm score	68 ± 14.4
Forgotten Joint Score	62.7 ± 23.2
Global Perceived Effect	2.1 ± 2.6
Compliance with rehabilitation protocol	No – 26 (16.9%) Yes – 128 (83.1%)
Failure	No – 119 (77.3%) Yes – 35 (22.7%)

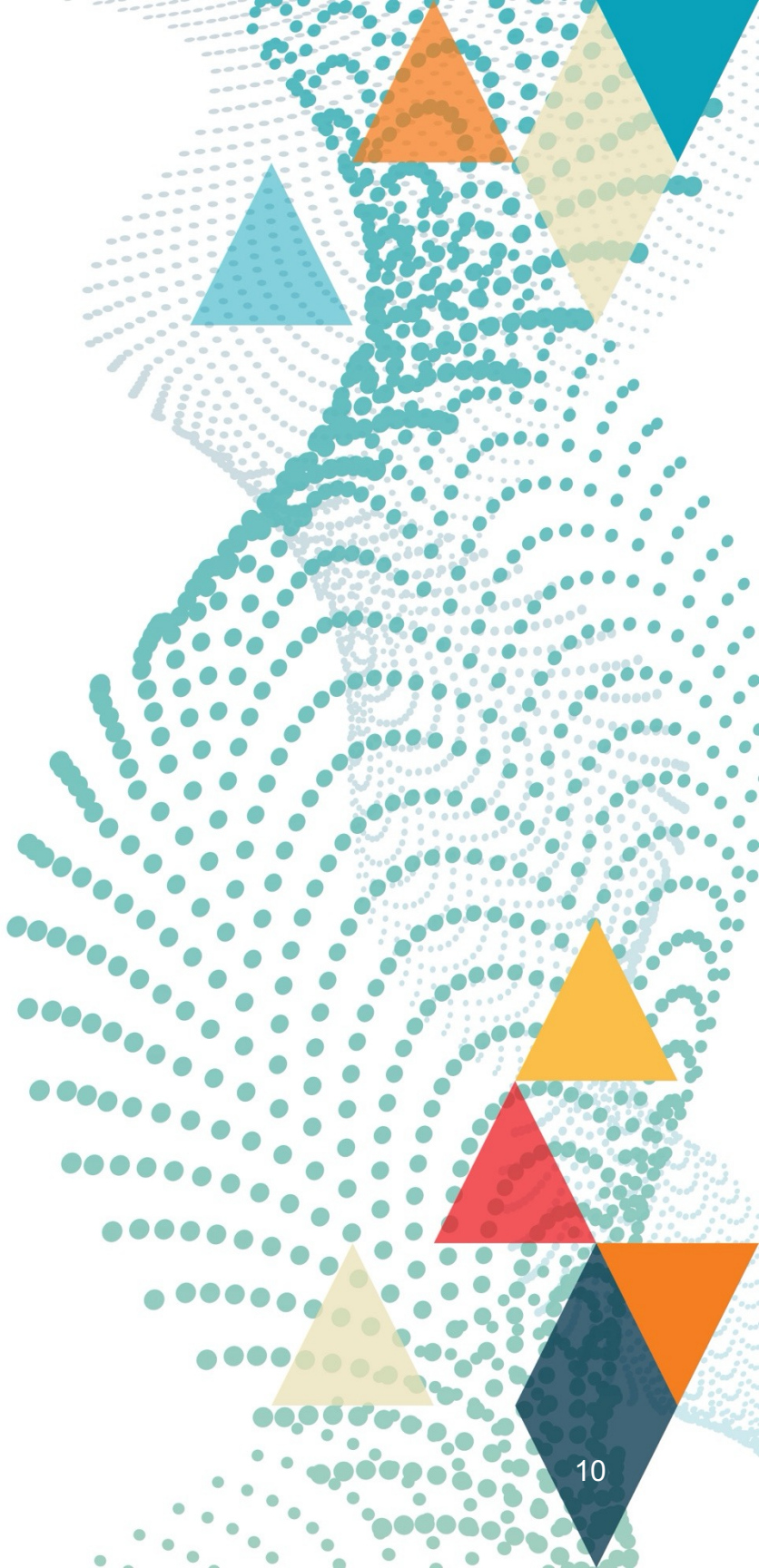
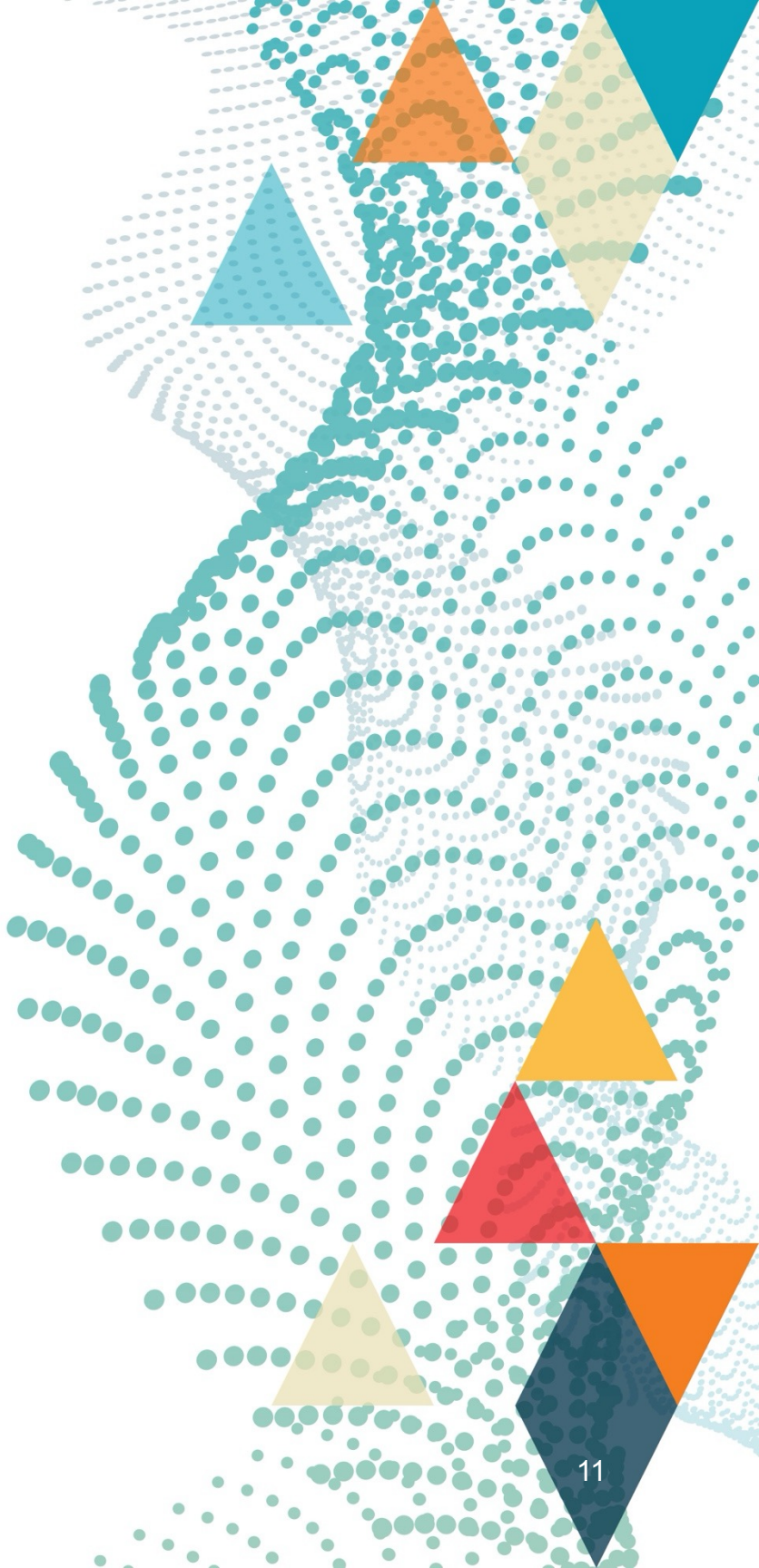


Table 3. Results of multivariable logistic regression model using backward stepwise algorithm to predict the risk of failure of the medial meniscus posterior root repair.

Variable		OR [95% CI]	p-value
Sex (Ref.: Female)		3.97 [1.50-10.52]	0.006
BMI (Kg/m2)		1.17 [1.04-1.32]	0.011
Femoral chondral injury (Outerbridge) (Ref.: 0)	1	5.03 [1.12-22.56]	0.035
	2	13.05 [3.01-56.66]	0.001
Compliance with rehabilitation protocol (Ref.: No)		3.40 [1.17-9.93]	0.025





CONCLUSION

- **Medial meniscus posterior root repair with transtibial tunnel has 77.3% good results with a mean follow-up of around four years.**
- **Female sex, high BMI, more pronounced femoral chondral injury, and poor patient compliance with rehabilitation were factors related to repair failure regardless of other variables.**

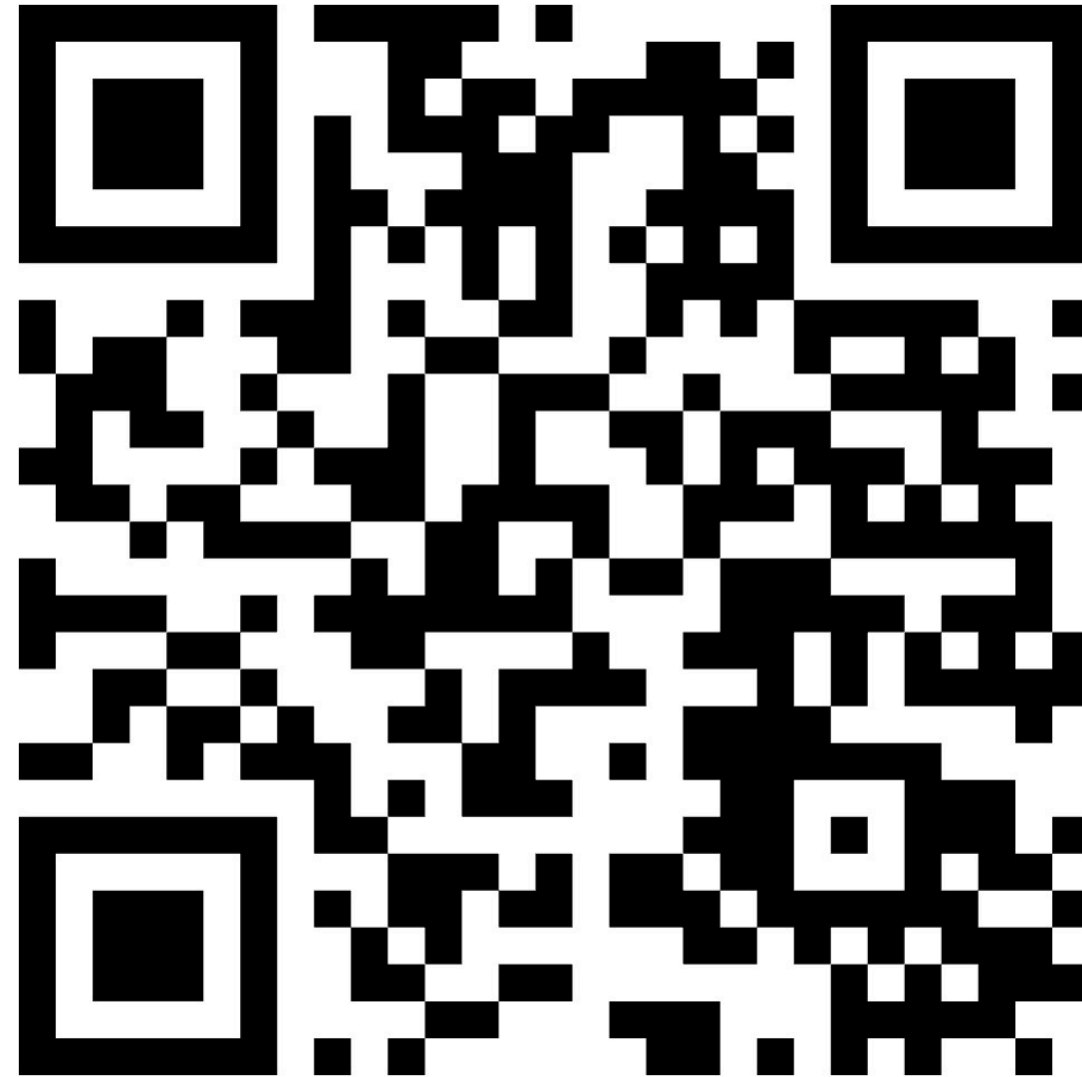


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