

Does Examination Table Paper Use Mitigate the Risk of Disease Transmission in a Family Medicine Clinic?

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ABSTRACT

Reducing examination table paper (ETP) use may help curb carbon emissions from health care. Six participants applied Glo Germ (DMA International) to their hands before a common physical examination (abdominal, cardiorespiratory, hip and knee) both with and without ETP. After each exam, UV light was shined on the exam table and photographs were taken. The number of hand touches on ETP-covered areas and uncovered areas were tallied and compared using *t* tests. Despite covering more surface area, participants touched areas without ETP significantly more than ETP-covered areas ($P < .05$). Despite its continued use, patients do not have much hand contact with ETP during common clinical examinations.

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INTRODUCTION

Climate change negatively impacts mental health, respiratory and cardiac disease, and quality-adjusted life years.¹ Waste from health care is a major contributor to its negative environmental impact,²⁻⁴ and a reduction in the use of examination table paper (ETP) may mitigate this.^{3,4}

Although ETP is thought to be necessary for hygienic care, this fragile, single-use pulp-product (crepe paper) does not stop disease transmission and may create a false sense of cleanliness.³ Although clean pulp paper can be recycled, contamination with medical waste may limit reprocessing and not offset manufacturing, processing, and distribution costs (both financial and environmental). Ontario Guidelines for Prevention and Control of Infection in Healthcare Settings do not endorse ETP use, instead they recommend cleaning surfaces with low-level disinfectants such as 60% to 80% alcohols, quaternary ammonium compounds, 3% hydrogen peroxide, and 0.5% accelerated hydrogen peroxide.⁵ Given the widespread use of ETP despite limited evidence of efficacy, does ETP use mitigate the risk of disease transmission in a family medicine clinic?

METHODS

Six family medicine clinic employees were recruited by word of mouth to participate in this study. This study was approved by the ethics review board at Winchester District Memorial Hospital and informed consent was obtained before data collection. The format and results of this manuscript adhere to SQUIRE (Standards for Quality Improvement Reporting Excellence) 2.0 guidelines.⁶

Study Procedure

Participants, acting as patients for the purposes of this study, were given 1.5 mL of Glo Germ (DMA International) and asked to spread it across both palms. Glo Germ, a fluorescent liquid, was used as a surrogate for contact transfer, as it can be applied to the hands of a participant, and be transferred to and identified on a surface.⁷ Participants underwent 1 of 3 common examinations (exams) performed in family medicine clinics (abdominal, cardiorespiratory, and hip and knee). Two exams of each type were completed by a resident physician. After the exam, the physician and participant left the room, and UV light was used to identify areas of the exam table with Glo Germ. Next, photographs were taken of the exam table to quantify transmission of Glo Germ from the participant's hands. The exam table was then cleaned with 0.5% accelerated hydrogen peroxide to remove any Glo Germ. This

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procedure was repeated with and without ETP for all 6 participants, resulting in 12 trials. For this study, the ETP covered approximately 75% of the exam table, leaving about 25% uncovered (12.5% on each side). Hand touches that had contact on both areas, with and without ETP, were counted as a touch for both.

Data Analysis

The number of hand touches on the area of the exam table covered with ETP and the area not covered with ETP were tallied and compared using paired sample *t* tests. These analyses evaluated differences between assessments with and without ETP. Due to the small sample size, non-parametric analyses were also completed (Wilcoxon rank sum test). Effect size was reported as Cohen's *d* (*t* tests) and *r* (Wilcoxon). Findings are expressed as mean (SD). Statistical tests were significant if $P \leq .05$ and were performed using SPSS statistical software, version 28 (IBM Corp).

Table 1. Exam Table Touches With and Without Exam Table Paper

Area of Table and Exam Types	Number of Touches, mean (SD)			P Value	
	With ETP	Without ETP ^a	Difference ^b	<i>t</i> Test	Wilcoxon
Covered area	0.67 (0.82)	1.00 (0.63)	0.33 (0.82)	.363	.317
Abdominal	1.50 (0.71)	1.50 (0.71)			
Cardiorespiratory	0.50 (0.71)	0.50 (0.71)			
Hip and knee	0.00 (0.00)	1.00 (0.00)			
Uncovered area	2.17 (1.33)	2.83 (1.60)	0.67 (0.82)	.102	.102
Abdominal	3.00 (1.41)	4.00 (0.00)			
Cardiorespiratory	1.00 (1.41)	1.00 (1.41)			
Hip and knee	2.50 (0.71)	3.50 (0.71)			
Total table	2.83 (1.94)	3.83 (2.13)	1.00 (1.55)	.175	.141
Abdominal	4.50 (2.12)	5.50 (0.71)			
Cardiorespiratory	1.50 (2.12)	1.50 (2.12)			
Hip and knee	2.50 (0.71)	4.50 (0.71)			

ETP = examination table paper.

Note: Each of 6 participants were examined for 1 type of examination twice (with and without ETP present). Each type of exam was performed with 2 participants.

^a When paper was not present, the area that would have been covered or not was retained for counts.

^b Difference represents the number of touches without paper compared with the number with paper.

RESULTS

Most (75%) of the touches across all exams occurred on areas not covered by ETP (Table 1). With ETP present, participants touched the uncovered area of the table an average of 2.17 times, which was 1.50 more touches than the area covered with ETP ($t[5] = 3.50$, $P = .017$; $z = 2.04$, $P = .041$, large effect size [$d = 1.59$; $r = 0.59$]). Without ETP, participants touched the uncovered area of the table 2.83 times, which was 1.80 more touches than the area of the table usually covered with ETP ($t[5] = 3.84$, $P = .012$; $z = 2.04$, $P = .041$, large effect size [$d = 2.53$; $r = 0.59$]). There were no statistical differences in the number of touches in the area with or the area without ETP between exam types ($P \geq .05$; Table 1, Figure 1).

DISCUSSION

This study found that participants touched uncovered areas of the exam table more often than the larger ETP-covered area. During exams, patients' clothes touch the ETP while their hands often grip uncovered sides of the table. Health care workers responsible for cleaning exam tables may falsely perceive them as cleaner using ETP, potentially missing the uncovered high contact areas; however, this was not assessed in the study. Certain sensitive exams (rectal, genital, and pelvic) and vulnerable populations (newborns and elderly) may still benefit from ETP. If ETP is used, covering a reduced segment of tables should be considered. When reducing ETP, signage reassuring patients that the exam table has been disinfected may be useful in limiting concern.

The economic and environmental costs of ETP cannot be overlooked. A clinic with approximately 100 patients per day

Figure 1. Photograph of exam table under UV light showing areas of touch.



may save \$75-\$90 CAD per week by eliminating ETP use.⁸ From an environmental view, a clinic that uses roughly 3 rolls of ETP per week (150 exams requiring the exam table) would

yield an annual carbon cost of 220 kgCO₂. To offset the carbon cost of ETP in this fictitious clinic, nearly 9 mature trees would need to be planted each year.^{9,10}

Some limitations of the study design include a small sample size that may limit the generalizability of our findings. Additionally, although participants were not informed about the ETP portion of this study, they were made aware that this was a study to assess germ transfer in family medicine clinics, which could have impacted their behavior. Participants may have altered how they interacted with their environment due to an awareness of Glo Germ on their hands; however, participant behavior was not suggested to be impacted by a germ-transfer medium in another similarly designed study.⁷ We may have seen different responses if the Glo Germ was applied to the back of participant's hands and forearms or to the hands of physicians performing the exams, which may be other sources of disease transfer. Given the results of our study, in Canada and perhaps other countries with similar health care structures, it may be time to consider reducing ETP in certain situations.



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Key words: clinical protocols; examination tables; primary health care; sustainable growth

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