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Surgical training through simulation dedicated to French Ob-gyn residents. Evaluation and satisfaction.

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1 Abstract

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3 Objective: In order to be able to develop surgical training of residents through simulation, we  
4 carried out a descriptive study, evaluating the satisfaction of participating residents and the  
5 benefit of the workshops offered during the 4 th Junior Master Class, free annual training  
6 organized in 2017 in Lille University Hospital. It is dedicated to ob-gyn residents in France,  
7 overseas departments and territories.

8 Material and Methods: During two days, plenary sessions and practical workshops on animal  
9 models or simulators were organized in laparoscopy, diagnostic and operative hysteroscopy,  
10 vaginal surgery and robotic surgery. A questionnaire was given anonymously to each student,  
11 collecting on the one hand their surgical curriculum, on the other hand, the evaluations of the  
12 theoretical contribution and the quality of the interventions and materials offered during the  
13 plenary sessions. The last part was subdivided into a questionnaire specific to each workshop.

14 Results: The 48 residents who voluntarily followed this training were overwhelmingly  
15 satisfied with the quality of the training offered. The practical benefits outweighed the  
16 theoretical benefits. These workshops improved their practical skills from 63% to 84%  
17 depending on the workshops offered. In addition, 100% of students would recommend this  
18 training to other residents and consider it useful for their future practice.

19 Conclusion: These very satisfactory results encourage us to organize new surgical training.  
20 Simulation is the key point for an appropriate surgical learning.

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31 Keywords: simulation; Ob-gyn; residents; surgery

32 Introduction

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34 The Junior Master Class (JMC) is the only free annual national training course dedicated to  
35 surgical training of French Ob-Gyn residents. Since its inception four years ago, no objective  
36 assessment of participant satisfaction has been carried out. In order to be able to develop this  
37 training, we carried out a descriptive study, assessing the satisfaction of the participating  
38 residents and the benefit of the workshops offered. We also gathered their impressions of the  
39 improvements to be made and their willing to participate in other sessions of JMC.

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74 Material and methods

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76 The JMC were organized at the University of LILLE on July 3 and 4, 2017 by an educational  
77 committee of gynecologists and obstetricians, in collaboration with the health simulation  
78 center (PRESAGE), the animal center of the Lille university Hospital and the “Société de  
79 Chirurgie gynécologique et pelvienne” (SCGP). The participating students were residents in  
80 obstetrics and gynecology in France, overseas departments and territories.

81 This training began with plenary sessions on anatomy, surgical techniques and procedure. The  
82 medicolegal aspects and future career opportunities were also approached.

83 The students were then divided into groups for one-and-a-half-hour practical workshops  
84 supervised by medical and or university professors.

85 Laparoscopy training was performed both on pelvitrainer and animal model. On pelvitainers,  
86 exercises on dexterity of increasing difficulty were organized. On animal model, performing  
87 basic surgical procedures was proposed (adhesiolysis, suturing with intra and extra corporal  
88 knots, tissue dissection). During the vaginal surgery workshop on animal models, we trained  
89 students in vaginal prolapse surgery with or without prothesis, obstetrics anal sphincter injury  
90 repair techniques and vaginal hysterectomy. Hysteroscopy workshop was based on animal  
91 models and simulators so as to perform diagnostic and operative hysteroscopy (uterine septum  
92 section, endometrectomy...). Finally, the surgical robot workshop was based on Da Vinci Xi  
93 simulation programs. The protocol was approved by our Regional Animal Use Committee  
94 (CEEA75) under number 00741.02 on May 15<sup>th</sup>, 2014 regarding surgeries performed on  
95 animals.

96 A questionnaire was given anonymously to each student on arrival at the training site. The  
97 first part was dedicated to the demographic characteristics of the students (age, sex, city of  
98 training, previous participation in surgical training). The second part concerned the evaluation

99 of the theoretical contribution, the quality of the presentations proposed during the plenary  
100 sessions, via a rating of 1 to 5, 1 corresponding to "very bad" and 5 to "excellent». The last  
101 part was subdivided into a questionnaire specific to each workshop, assessing the basic level  
102 and current practices of each student, then the satisfaction and personal benefit obtained from  
103 each practical workshop. The data collected was translated and analyzed using Excel-type  
104 software. Satisfaction rates were calculated as a percentage of the number of participants who  
105 answered each question.

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## 145 Results

146 Forty-eight French residents, whose region of origin appears in Figure 1, were randomly  
147 divided into six groups of eight students. At the end of the training, all responded to the  
148 evaluation questionnaire and recommended this training to other interns. Of the sixty-six  
149 questions contained in the questionnaire, we analyzed the responses of thirty-eight questions,  
150 or 57%, to meet the specific objective of our study.

151 Regarding the students, the average age was 27 years old, mainly women, having already  
152 completed one or more semesters of gynecological or general surgery (Table 1).

153 The evaluation of the plenary sessions reveals an average note of 4 out of 5 for all categories  
154 (theoretical contribution, quality of support and intervention) regardless of the subject  
155 covered. Before the training, the participants considered themselves to be mostly not well  
156 trained in vaginal prosthesis placement (94%), vaginal hysterectomy (80%), laparoscopy  
157 (81%) and operative hysteroscopy (66%). Conversely, they consider themselves good or very  
158 good at the practice of diagnostic hysteroscopy (64%) (Table 2).

159 The workshops resulted in a relative improvement in their practice in vaginal prosthesis  
160 placement (63%), vaginal hysterectomy (84%) and laparoscopy on pelvitrainer and on animal  
161 model (84%). As for the theoretical contribution, the students consider it satisfactory or very  
162 satisfactory for the Robot workshop (89%) and in the laparoscopy workshop (67%) on animal  
163 models (Table 3). The quality of each workshop was also assessed by the participants. For the  
164 vaginal hysterectomy on animal model, laparoscopy (animal model and pelvitrainer) and  
165 robot simulation workshops, 83 to 96% of participants gave excellent marks. Regarding the  
166 hysteroscopy (diagnostic and operative) and vaginal surgery (anal sphincter repair on an  
167 animal model) workshops, 71 and 80% of students are very satisfied (Figure 2). Through the

168 free comments, many students underlined the quality of the internal organization and the  
169 dynamism of the working groups.

## 170 Discussion

171 Residents who followed this training were overwhelmingly satisfied with the quality of the  
172 training offered and the practical benefits outweighed the theoretical benefits. These  
173 workshops improved their practical skills from 63% to 84% depending on the workshops  
174 offered. In addition, 100% of students would recommend this training to other interns and  
175 consider it useful for their future practice.

176 In fact, simulation in gynecological surgery makes it possible to increase the technical  
177 performance of students in obstetrics and gynecology (1)(2) and their self-confidence (3) (4),  
178 while guaranteeing patient safety during the learning curve. Greer et al. found in a study  
179 published in 2014, a significant increase in self-confidence in the realization of vaginal  
180 hysterectomy without supervision after simulation exercises for 30 students of obstetrics and  
181 gynecology(2). In 2019, Tejos et al. showed an increase in the number and complexity of  
182 laparoscopic procedures performed by students who benefited from a simulation training  
183 program (1). In 2020, Margueritte et al. described an initiation program to robotic in vivo  
184 gynecological surgery for junior surgeons (5). These studies show the usefulness of such  
185 training in obstetrics and gynecology in measuring the progress and abilities of students, but  
186 little interest in participant satisfaction. This is the aim of Lille JMC. The JMC are dedicated  
187 to the 1020 obstetrics and gynecology residents in France (204 obstetrics and gynecology  
188 residents in 2018/2019 out of 8407 total residents) (6). Forty-eight places were available for  
189 this training, allowing 23% of French obstetric gynecology residents to participate.  
190 Nonetheless it shows how difficult it is for students to access this type of free training. In a  
191 review of the literature, Cory McLaughlin et al. show that 38% of surgical simulation studies  
192 are dedicated to training residents while 62% are dedicated to surgeons and 79% to nurses (7).



193 In France, in 2013, a student spent around 1,050 euros per year for his compulsory theoretical  
194 training according to the InterSyndicat National des Internes (8).

195 Before 2012, medical training, with the exception of cadaver dissection, was mainly based on  
196 companionship "in bed"(9). In 2012, la Haute Autorité de Santé (HAS) published  
197 recommendations for the introduction of simulation in medical learning. In 2017, the  
198 residency and the second cycle reform stated the allocation of a half-day of university training  
199 per week. This encourages the implantation of simulation centers in all university hospital in  
200 France. Simulation training allows to evolve in a standardized framework by acquiring  
201 multiple capacities of technical, relational and ethical nature in the medical studies program. It  
202 encourages "the involvement of actors, kindness and positive culture of error with an impact  
203 on patient safety" (9). Its assessment is recommended by drawing up an individual  
204 curriculum.

205 One limitation of our study is the lack of standardization of the satisfaction questionnaire  
206 since 43% of the questions were not analyzed. In 2014, the SFAR (French Society of  
207 Anesthesia and Resuscitation) carried out an update on simulation in medical studies in North  
208 America (10). It describes two methods for evaluating simulation training. The "formative"  
209 assessment, the aim of which is to determine the training actions to be taken to improve an  
210 individual clinical practice and assess training needs at the group level. This formative  
211 assessment was used in our study. However, we were unable to assess the progress and  
212 performance of each individual. This is usually done through a pre and post test questionnaire  
213 and / or feedback. This evaluation is called "summative" and aims to evaluate the  
214 performance of an individual to obtain a score. It might be interesting to combine the two  
215 types of assessment for future projects and to rely on standardized questionnaires for all  
216 workshops.

217 Despite the overall satisfaction of the students, these training courses remain too infrequent. J.  
218 Dahlberg et al. in 2018 shows that simulation in obstetrics and gynecology has an impact on  
219 the technical improvement of participants with a 10-year follow-up at the frequency of 6  
220 annual training sessions (11). It therefore seems essential to increase the number of these  
221 training courses and to improve the number of participants. Even if the 32 university hospitals  
222 in France have a dedicated simulation center, there is an insufficient teacher / student ratio of 1  
223 in 5 to 10 according to Prof. A.Tesnière (12). Structures such as The IRCAD (Institute for  
224 Research against Cancers of the Digestive System) in Strasbourg or the CICE (International  
225 Center for Endoscopic Surgery) in Clermont Ferrant and many conferences offer practical  
226 surgical training for a fee.

227 The observance of national recommendations is currently not guaranteed by the lack of  
228 financial and human contribution. This is why, despite the investment of volunteer  
229 supervisors, the cost of such training and its logistical requirements do not allow, today, to  
230 increase their frequency while guaranteeing free access.

231 Finally, one of the positive points widely raised by the students was the proximity between  
232 teachers and residents relative to the low numbers of working groups, and the richness of  
233 exchanges between residents from different regions. In order to bring together quality  
234 teaching and student expectations, we could imagine an association of senior / junior  
235 supervisors for each workshop.

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242 Conclusion

243 These very satisfactory results encourage us to organize new surgical training. Technical  
244 Improvements are possible by incorporating groups of different surgical level, the provision  
245 of anatomical diagrams and the preoperative review of surgical techniques. It would be  
246 interesting to be able to offer more training courses such as the JMC across France by  
247 structuring them by levels of difficulty.

248 It is no longer a question of proving the usefulness of simulation for the learning of medical  
249 students but of seeking to integrate it into the curriculum of health training.

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317 Table 1: Population

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	Participants (n=48)
Age (mean and standard deviation)	27 years (+/- 1.7 years)
Seniority (average of the number of validated semesters and standard deviation)	4 (+/- 2.5)
Female	83 %
Number of students who have already completed at least one semester of urological surgery	45 %
Number of students who have already completed at least one semester of visceral surgery	52 %
Number of students who have already completed at least one semester of gynecological surgery	69 %
Number of students who have already completed at least one surgical training course	83 %

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346 Table 2 Self-evaluation of participants in each surgical technique before training (in  
 347 percentage out of n = number of participants who answered the question).  
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	Bad (%)	Middling (%)	Good (%)	Very good (%)	No answer (%)
Prolapse surgery with vaginal mesh insertion (n=48)	67	27	4	2	0
Diagnostic hysteroscopy (n=48)	4	31	54	10	0
Operative hysteroscopy (n=47)	15	51	32	2	2
Vaginal hysterectomy (n=45)	40	40	20	0	6
Laparoscopy (n=45)	22	64	11	2	6

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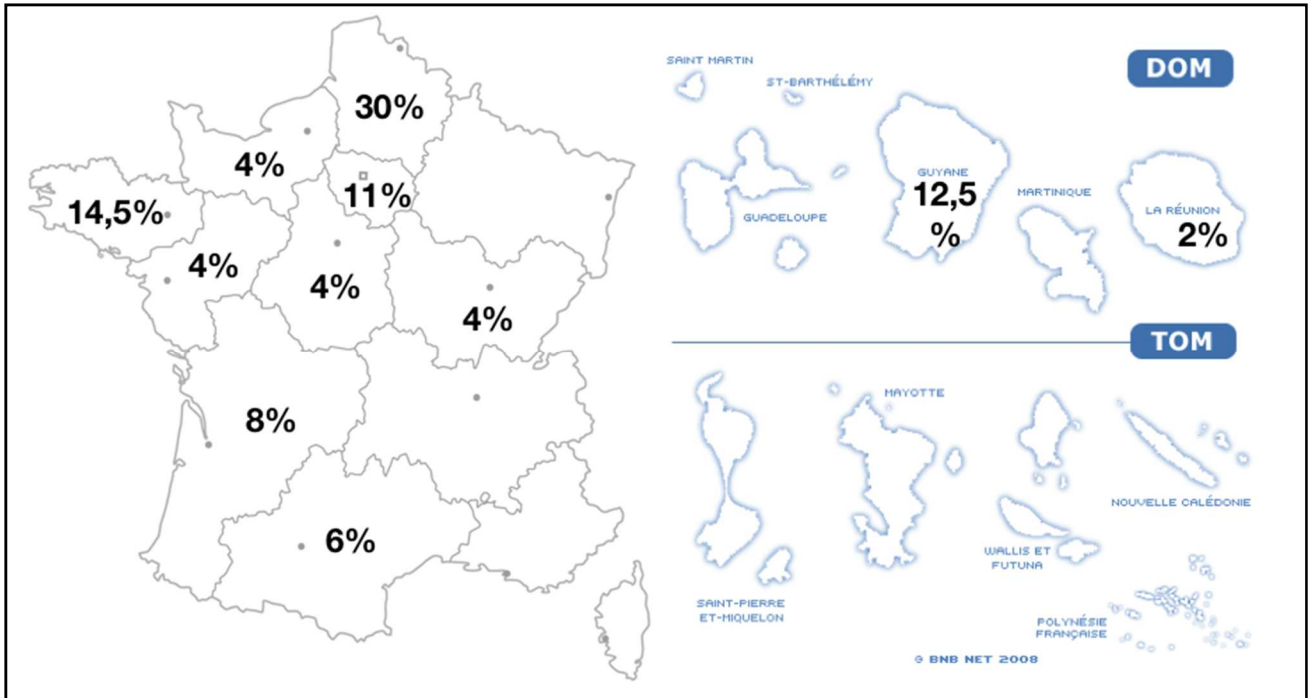
377 Table 3: Theoretical and practical contribution of each workshop. NE = Not Assessed  
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	Practical benefits			Theoretical benefits		
	Yes (%)	No (%)	No answer (%)	Yes (%)	No (%)	No answer (%)
Robotic surgery (n=46)	85	15	4	89	11	4
Laparoscopy (n=48)	84	10	0	67	29	0
Prolapse surgery with vaginal mesh insertion (n=38)	63	34	21	NA	NA	NA
Diagnosis hysteroscopy (n=46)	74	27	4	NA	NA	NA
Operative hysteroscopy (n=47)	81	19	2	NA	NA	NA
Vaginal hysterectomy (n=48)	84	17	0	NA	NA	NA
Pelvitainer (n=48)	86	15	0	NA	NA	NA

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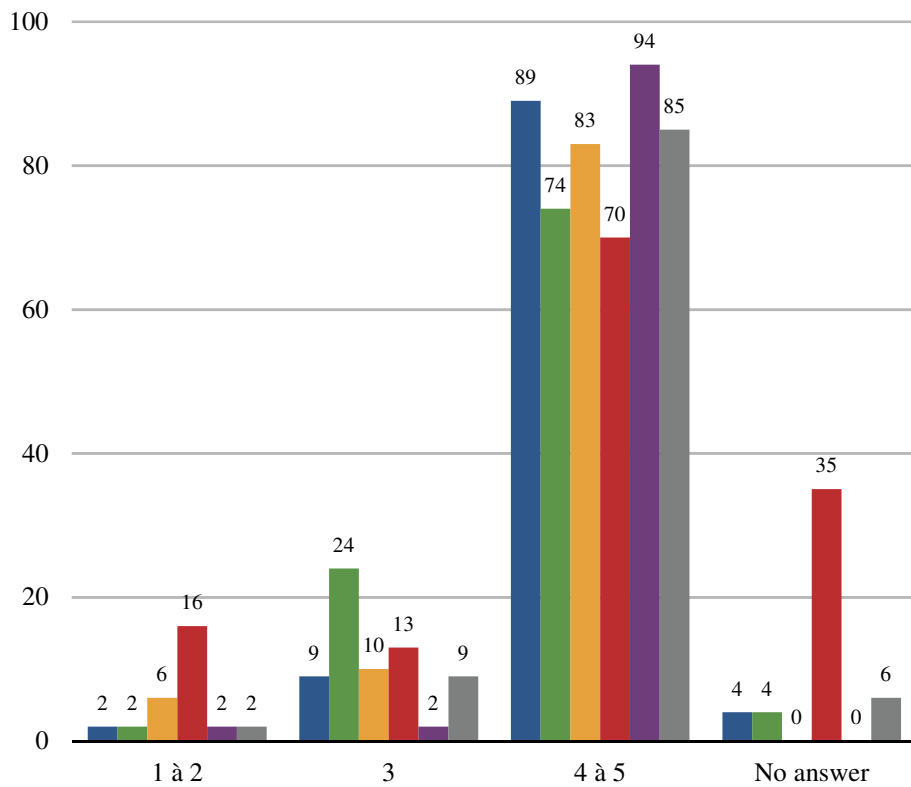
Figure 1: Geographical repartition of the residents (n=48)



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431 Figure 2: Satisfaction (%), 1 and 2 to score (really bad to bad), 3 (middling), 4 and 5 (good to  
 432 excellent).  
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434 ■ Robotic surgery                      ■ Hysteroscopy                      ■ Vaginal surgery/hysterectomy  
 ■ Chirurgie vaginale /sphincter      ■ Pelvitruiner                      ■ Laparoscopy

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