



## Optimised gynaecological examination with a new pelvic examination chair

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### ABSTRACT

**Objective:** The present aim was to contribute to improving the traditional pelvic examination chair with vertical leg support and to evaluate patients' and examiners' experience of a new gynaecological and urological examination chair with heated upholstery.

**Study design:** A new gynaecological and urological examination chair was constructed with laterally adjustable leg support, a foot-plate and the perineum exposed only during the examination procedure. Patients (n = 131) with or without endometriosis were invited to participate in an anonymous questionnaire survey concerning how they experienced a gynaecological examination.

**Main outcome measures:** The patients and the gynaecologists who performed the examinations answered questionnaires evaluating the examination procedure in the traditional and in the new gynaecological and urological examination chair, respectively. The questionnaires asked about comfort, heating, integrity and the experience of pelvic examination with vertical or lateral leg support. The examination times were measured with a stopwatch.

**Results:** The majority of the answers (n = 131) were significantly (p < 0.05–0.001) in favour of the new concept with lateral leg support and with increased comfort and integrity. The average examination time was significantly shortened and the patients more relaxed in the new gynaecological and urological examination chair.

**Conclusion:** The traditional gynaecological chair with vertical leg support has remained basically unchanged for many years. The present study showed that the pelvic examination procedure can be significantly optimized with easy patient-friendly adaptations.

### Introduction

Pelvic examinations are carried out daily in urological and in gynaecological clinics. Many women have mixed feelings and worried expectancy on gynaecological examinations [1]. After an unpleasant examination, the patient will be reluctant to undergo future pelvic examinations [2]. The examination process is intrusive for the patient's integrity and to compensate, discomfort should be avoided during the procedure [3]. Improved comfort and increased integrity are important for all patients, particularly for the adolescent examined for the first time [4,5].

A pelvic examination involves exposure of intimate parts of the body in a vulnerable situation. Physical factors such as cold instruments, vertical leg supports with a hard and unpleasant surface and

examination chairs with an uncomfortable surface are factors that contribute to the experience of the examination [6,7]. The gynaecological chair with vertical leg supports has basically remained unchanged for many years, the only major change being the addition of a foot-operated electric motor that allows optimal positioning of the patient for the examining gynaecologist, midwife or urologist.

Design studies greatly affect physical and psychological factors [8]. Awkward examination positions with low patient control may cause psychological stress for patients, with a subsequent risk of generating or magnifying a negative experience. Regular gynaecological screening with pap-smears may be declined by patients who have had a negative experience of gynaecological examination. Patients with endometriosis report increased pain when lying on a cold surface in a regular gynaecological chair and sometimes bring their own heating pads to place

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**Fig. 1.** The new gynaecological and urological examination chair with lateral leg support.

under the lumbar region. The gynaecological examination process needs to admit open communication between the patients and the health care staff, and also with designers, with the purpose of developing comfortable pelvic examination chairs [9,10].

Existing research into patient's experiences of gynaecological and urological examinations was surveyed. From the collected information, a new design was created and prototypes were constructed. The new design without traditional vertical leg support exposed the perineum only during the examination procedure. The prototype had individually adjustable lateral leg support and a soft, warm comfortable surface adapting to the patient's configuration (Fig. 1). The shorter part under the pelvis could make the patient spontaneously place herself correctly for examination without delay.

A company, Oscar Medtec AB, was called in to construct the prototypes according to the study criteria for a pelvic examination chair. Early co-operation, was initiated with the possibility of later commercialization to get the new chair into clinical practice. The final version of a comfortable gynaecological and urological examination chair should be economically affordable for the public health-care system and thus as little changed as possible from the traditional chair was desirable. The basin under the traditional pelvic examination chair was replaced by a smaller bowl which could be moved to the side, thus, hiding instruments and disposables from the patient after the examination (Fig. 1). To improve comfort for patients with pain, adjustable heating in the upholstery was built in and the regular vertical leg supports were substituted with a lateral support and a foot-plate, enabling the patient to abduct the hip-joint by the minimum needed for the particular examination. The objective with the project was thus to improve comfort and integrity during a pelvic examination. The hypothesis was that improvement of the chair would accomplish this.

## Methods

The new gynaecological and urological chair was developed primarily to increase the comfort by removing the traditional vertical leg supports and using soft upholstery with built-in heating (Fig. 1). The setting for evaluation of the gynaecological and urological chairs, was the outpatient gynaecological wards of Uppsala University Hospital and Danderyd Hospital, respectively.

After the gynaecological clinical examinations including vaginal ultrasound, the patients and the health-care professionals were invited to answer anonymous questionnaires produced for the present study to collect feed-back for continued technical development. Since this was a novel design, there were no appropriate validated questionnaires. The evaluation, with questions about the examination situation from both the patients' and the gynaecologists' perspectives, was carried out in two separate observational study periods. During the first period, 50 questionnaires were filled out after gynaecological examinations of



**Fig. 2.** The traditional gynaecological examination chair with vertical leg support.

patients on outpatient endometriosis units. The examiners were male and female gynaecologists subspecialised in endometriosis ( $n = 4$ ): Nineteen questionnaires were completed referring to the traditional gynaecological examination chair with vertical leg support (Fig. 2) and 31 to the new chair with laterally adjustable leg support and a foot-plate (Fig. 1).

The second version of the new examination chair included the addition of a footrest (Fig. 1) which facilitated for the patients as well as for the health-care examiner. The second part of the investigation focused on general gynaecological patients in the outpatient wards of the participating hospitals and the examination times were also measured using a stop-watch in the examiner's pocket. It was started and stopped when the patient sat on the edge of the chair before and after the examination. The patients were examined in the chair that was available in the examination room they were scheduled. Patients undergoing colposcopy were excluded for logistic reasons. Each participating gynaecologist ( $n = 10$ , male and female) examined the same number of patients in the new gynaecological/ urological chair and traditional examination chair, respectively. Seventy-one completed questionnaires were obtained: 34 after examination in the traditional gynaecological examination chair and 37 in the new gynaecological and urological examination chair with lateral leg support (Table 2). The questionnaires were anonymous and coded and collected feedback on an easy five-graded scale rating 1–5 from negative to positive with the following questions for pelvic examination chairs;

### Patients' questions:

- How do you feel about a gynaecological examination?
- How comfortable was the examination chair?
- How did you find the warmth in the chair?
- How did you experience the feeling of integrity in the chair?
- Did you feel in control of the examination situation?
- Did you experience pain during the examination?
- Would you consider undergoing another examination in this chair?
- Would you consider recommending undergoing an examination in the same chair?
- How did you experience an examination with vertical/lateral leg support?

### Clinicians' questions:

- How did you experience the adequacy of the examination chair?
- How was the manoeuvrability of the chair?
- How did you get the patient in the right position for examination?
- How relaxed did you feel the patient was?

**Table 1**

Rating 1–5 from negative to positive (mean ± SEM)	Traditional	New	p-Value
<i>Endometriosis patients' rating of the traditional (n = 19) gynaecological chair compared to the new (n = 31) gynaecological and urological examination chair</i>			
1. Expectation on a gynaecological examination	4.0 ± 0.23	3.2 ± 0.30	NS
2. Comfort in the pelvic examination chair	2.8 ± 0.22	4.6 ± 0.14	p < 0.001*
3. Warmth in the pelvic examination chair	2.5 ± 0.33	4.0 ± 0.33	p < 0.001†
4. The feeling of integrity in the chair	2.5 ± 0.35	3.9 ± 0.28	p < 0.001*
5. The feeling of control during the examination	3.0 ± 0.33	4.1 ± 0.15	p < 0.05*
6. Experience of pain during the examination (VAS scale)	3.2 ± 0.65	2.3 ± 0.50	NS
7. Attitude towards another examination in the same pelvic examination chair	3.0 ± 0.34	3.7 ± 0.34	NS
8. Attitude towards recommending an examination in the same pelvic examination chair?	3.0 ± 0.34	3.7 ± 0.34	p < 0.05*
9. Experience of resting the legs with vertical or lateral leg support?	1.9 ± 0.40	3.7 ± 0.33	p < 0.01*
<i>The gynaecologists' rating of the traditional (n = 19) chair compared to the new (n = 23) gynaecological and urological examination chair when examining endometriosis patients</i>			
1. Adequacy of the pelvic examination chair	3.6 ± 0.21	4.5 ± 0.18	p < 0.01*
2. The manoeuvrability of the pelvic examination chair	2.8 ± 0.18	4.2 ± 0.19	p < 0.001*
3. Getting patient in the right position for examination	3.0 ± 0.20	4.1 ± 0.27	p < 0.001†
4. The patient's relaxation during the pelvic examination	3.1 ± 0.24	4.4 ± 0.16	p < 0.001†
5. The contact with your patient during the examination	3.2 ± 0.23	4.3 ± 0.22	p < 0.001†
6. Patient's integrity in the pelvic examination chair	2.0 ± 0.24	4.3 ± 0.50	p < 0.001†
7. The bowl under the pelvic examination chair	2.6 ± 0.41	2.0 ± 0.44	NS
8. The possibility to get assistance	3.0 ± 0.45	2.1 ± 0.41	p < 0.01*
9. Conditions for carrying out a vaginal ultrasound	3.6 ± 0.30	4.6 ± 0.23	p < 0.01*

\* In favour of the new design with lateral leg support.

How did you experience the contact with the patient during the examination  
 How did you experience the patient's integrity in the chair?  
 How did the basin under the seat function during the examination?  
 What were the possibilities for assistance during the examination?  
 How did you find the conditions for performing vaginal/abdominal ultrasound?  
 How long did the examination last in minutes?

Statistics were carried out using the Mann-Whitney U test since the samples were independent. The project was evaluated and approved by the Regional Ethics Committee (2015/6-31/4) in Stockholm.

## Results

The first 50 questionnaires showed significant support for the new gynaecological and urological chair from a majority of the aspects evaluated (p < 0.05–0.001, Table 1). The new chair was rated more comfortable and respectful of the patient's integrity. There were no differences between the patient groups in their attitude towards undergoing a gynaecological examination, nor in any experience of pain during the examination. A question concerning the experience of examination with lateral leg support was rated 3.7 on the five-graded scale; that is higher (p < 0.01) than the 1.9 rating for the traditional pelvic examination chair with vertical support.

A second survey (71 questionnaires) was run one year later when a further-developed version of the prototype had been introduced in the clinic. In this part of the investigation and evaluation of the second version, the results were more clearly in favour of the new design from a majority of the aspects evaluated (p < 0.01–0.001, Table 2). During this part the examination times were taken, demonstrating a shorter average time. In the new chair with lateral leg support, the duration of the pelvic examination was 1.6 minutes shorter per patient (Table 2). In the second part of the investigation the gynaecologists (n = 10) were more positive to the new gynaecological and urological examination chair on all the eight issues investigated (Table 2). Again, there were no differences between the group of participating patients in their expectation of a gynaecological examination or their experience of pain during the examination. The question concerning the experience of examination with lateral leg support was rated by the patients 4.6 on the five-graded scale and significantly higher (p < 0.001) than the 3.1

for the traditional chair with vertical leg support.

Some patients and gynaecologists did not answer all questions and therefore there is a variation in the number of the answers (Tables 1 and 2).

## Discussion

The gynaecological chair with vertical leg support, in its present form also used for men, has basically had the same design for the past 100 years. Depending on the reason for the gynaecological or urological examination, there is a risk that a patient will be reluctant to undergo any further pelvic examinations [11]. Increased comfort and high integrity can contribute to a neutral or maximally positive experience of the examination. This has also been found in previous investigations of the gynaecological examination procedure [12]. The present change from the traditional gynaecological chair with vertical leg support, involved only a few adjustments such as building in heating in soft upholstery, substituting the vertical with adjustable lateral leg support and a foot-plate, and thereby exposing the perineum only during the investigation. Further electrical motors facilitated precise positioning of the patient and thus the examination process for the health-care worker. Several pelvic examination chairs with lateral leg support are in production but no other with heated upholstery.

The present results demonstrated that minor adjustments to the pelvic examination chair gave a more positive experience for the patients from a majority of the aspects investigated. Also, the gynaecologists rated the new chair design higher on 8 of the 9 functions investigated in first part of the investigation (Table 1) and on all aspects in the second part (Table 2). The examination time was reduced with lateral leg support which might be due to improved integrity, the warmth and the comfort which all helped the patient relax. With a patient resting comfortably in the new examination chair, a shorter examination time was needed. The time saved per day with the new chair design on an outpatient gynaecological clinic, meant that one more patient can be examined per day and gynaecologist. Thus, the new design can partly outweigh the purchase price difference between the chairs. Increasing the quality of the pelvic examination chair can be self-financed.

There has been no previous investigation of patients' or examiners' experiences of gynaecological chairs. The strength of the present work is that the patients gave anonymous feedback and could feel free to give their innermost points of view of the procedure without risk of

Table 2

Rating 1–5 from negative to positive (mean ± SEM)	Traditional	New	p-Value
<i>The gynaecological patients' ratings of the traditional chair (n = 32–34) compared to the new (n = 33–37) gynaecological and urological examination chair with a footrest added</i>			
1. Expectation on a gynaecological examination	3.8 ± 0.25	3.6 ± 0.21	NS
2. Comfort in the pelvic examination chair	2.9 ± 0.23	4.7 ± 0.097	p < 0.001*
3. Warmth in the pelvic examination chair	3.1 ± 0.22	4.8 ± 0.076	p < 0.001*
4. The feeling of integrity in the examination chair	2.8 ± 0.24	4.2 ± 0.13	p < 0.001*
5. The feeling of control during the examination	3.4 ± 0.24	4.3 ± 0.15	p < 0.01*
6. Experience of pain during the examination (VAS scale)	2.7 ± 0.45	2.6 ± 0.46	NS
7. Attitude towards another examination in the same pelvic examination chair	3.8 ± 0.25	5.0 ± 0.038	p < 0.001*
8. Experience of resting the legs with vertical or lateral leg support	3.1 ± 0.25	4.6 ± 0.15	p < 0.001*
<i>The gynaecologists' rating of the traditional (n = 28–35) and the new gynaecological and urological (n = 26–35) examination chair during examination of general gynaecological outpatients</i>			
1. Suitability of the pelvic examination chair?	3.4 ± 0.13	4.7 ± 0.088	p < 0.001*
2. The manoeuvrability of the pelvic examination chair	3.4 ± 0.14	4.6 ± 0.11	p < 0.001*
3. Getting patient in the right position for examination	3.5 ± 0.13	4.5 ± 0.12	p < 0.001*
4. The patient's relaxation during the pelvic examination	3.1 ± 0.17	4.5 ± 0.095	p < 0.001*
5. Patient's integrity in the pelvic examination chair	2.9 ± 0.083	4.6 ± 0.12	p < 0.001*
6. The bowl under the pelvic examination chair	3.3 ± 0.14	4.6 ± 0.17	p < 0.001*
7. The possibility to get assistance	3.3 ± 0.14	4.7 ± 0.13	p < 0.001*
8. Conditions for carrying out a vaginal ultrasound	3.6 ± 0.13	4.8 ± 0.069	p < 0.001*
9. The duration of the gynaecological examination (min.)	6.2 ± 0.37	4.6 ± 0.32	p < 0.001*

\* In favour of the new design with lateral leg support.

offending. As against this, questionnaires design limited collection of detailed patient data. However, the primary intention was to collect technical feed-back on the gynaecological chair used for the particular examination. The investigation was carried out as an externally-financed evaluation of pelvic examination chairs and was not initiated by the constructor. Investigator bias cannot be excluded but was compensated for by the fact that several gynaecologists participated.

Further investigations are ongoing concerning the perceived psychological effect of the chair colour. In that separate study a white gynaecological and urological examination chair has been compared with a blue but otherwise identical chair. Men's psychological experience of a pelvic examination has been insufficiently studied but is also being investigated and will be reported in forthcoming studies. Technical developments to improve the patients' and health-care workers' comfort and make health-care more effective ought to be given high priority. A feeling of respect for integrity, of comfort and an individual approach, is essential for the patient undergoing a pelvic examination [13].

## Conclusion

The present study has demonstrated that the pelvic examination procedure can be significantly optimized with easy patient-friendly adaptations. Technical development of the traditional pelvic examination situation is an important step forward. Further development of the examination chair is a highly relevant area for the benefit of patients and health-care professionals. The ultimate goal is an affordable, gender-neutral product improving comfort during a pelvic examination irrespective of the patient's health condition.

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## Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.srhc.2019.01.001>.

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