

Interdisciplinary S2k Guidelines for the Diagnosis and Treatment of Endometriosis

Short Version – AWMF Registry No. 015–045, August 2013

Interdisziplinäre S2k-Leitlinie für die Diagnostik und Therapie der Endometriose

Kurzversion – AWMF-Register-Nummer: 015-045, August 2013

Authors

U. Ulrich¹, O. Buchweitz², R. Greb³, J. Keckstein⁴, I. von Leffern⁵, P. Oppelt⁶, S. P. Renner⁷, M. Sillem⁸, W. Stummvoll†⁹, K.-W. Schweppe¹⁰, for the Task Force Group “Endometriosis Guidelines” of the German and Austrian Societies for Obstetrics and Gynecology

Affiliations

The affiliations are listed at the end of the article.

1 Information on these guidelines

1.1 Editors

German and Austrian Societies for Obstetrics and Gynecology (Deutsche und Österreichische Gesellschaften für Gynäkologie und Geburtshilfe), Association of the Scientific Medical Societies of Germany (Arbeitsgemeinschaft der wissenschaftlichen medizinischen Fachgesellschaften, AWMF).

1.2 Funding

Compilation of the present guidelines was partly financially supported by the German Society for Obstetrics and Gynecology and its Working Group Gynecologic Endoscopy (Arbeitsgemeinschaft Gynäkologische Endoskopie, AGE).

1.3 Lead professional organizations

German and Austrian Societies for Obstetrics and Gynecology (DGGG and OEGGG).

1.4 Contact

Prof. U. Ulrich, M.D., Martin Luther Hospital, Caspar-Theyß-Straße 27–31, 14193 Berlin, Germany.

1.5 Additional information

The present short version is based on the full version of the S2k Guidelines for the Diagnosis and Treatment of Endometriosis, accessible via internet as follows:

- ▶ <http://www.awmf.org/leitlinien/aktuelle-leitlinien.html>
- ▶ <http://www.dggg.de>
- ▶ <http://www.oeggg.at>
- ▶ <http://www.sggg.de>
- ▶ <http://leilinen.net>
- ▶ <http://AG-Endoskopie.de>

Additional information on the topic is available through:

- ▶ Endometriosis Research Foundation (Stiftung Endometrioseforschung, <http://www.endometriose-sef.de>)
- ▶ The Royal College of Obstetricians and Gynaecologists Clinical Green-Top Guidelines for the Investigation and Management of Endometriosis (<http://www.rcog.org.uk/>)
- ▶ ESHRE Guideline for the Diagnosis and Treatment of Endometriosis (<http://www.eshre.eu>)
- ▶ The American College of Obstetrics and Gynecology Committee on Practice Bulletins (<http://www.acog.org/>)
- ▶ Guidelines report of the present guidelines (see full version).

Bibliography

DOI <http://dx.doi.org/10.1055/s-0033-1350810>
 Geburtsh Frauenheilk 2013; 73: 890–898 © Georg Thieme Verlag KG Stuttgart · New York · ISSN 0016-5751

Correspondence

Prof. Dr. Uwe Ulrich
 Department of Obstetrics and Gynecology
 Martin Luther Hospital
 Caspar-Theyß-Straße 27–31
 14193 Berlin
u.ulrich@mlk-berlin.de

DGGG-Leitlinienssekretariat

Prof. Dr. med. Matthias W. Beckmann,
DGGG-Leitlinienbeauftragter
 Frauenklinik
 Universitätsklinikum Erlangen
 Universitätsstraße 21–23
 91054 Erlangen
 Tel.: 091 31-85-335 07/44063
 Fax: 091 31-85-339 51

1.6 Responsibilities

1.6.1 Task Force Group for these guidelines

Directing author

Name	Place
Prof. Uwe Ulrich, M. D.	Berlin, Germany

Expert panel (Task Force Group Endometriosis Guidelines)

Name	Place
Olaf Buchweitz, M. D.	Hamburg, Germany
Radek Chvatal, M. D.	Znaim, Czech Republic
Prof. Rudy-Leon De Wilde, M. D.	Oldenburg, Germany
Prof. Andreas D. Ebert, M. D., Ph.D.	Berlin, Germany
Bruno Engl, M. D.	Bruneck, South Tyrol
Ingo von Leffern, M. D.	Hamburg, Germany
Prof. Robert Greb, M. D.	Dortmund, Germany
Gülden Halis, M. D.	Berlin, Germany
Dietmar Haas, M. D.	Linz, Austria
Prof. Jürgen Hucke, M. D.	Wuppertal, Germany
Prof. Jörg Keckstein, M. D.	Villach, Austria
Prof. Michel Müller, M. D.	Berne, Switzerland
Prof. Peter Oppelt, M. D.	Linz, Austria
Stefan P. Renner, M. D.	Erlangen, Germany
Martin Sillem, M. D.	Mannheim, Germany
Prof. Karl-Werner Schweppe, M. D.	Westerstede, Germany
Wolfgang Stummvoll†, M. D.	Linz, Austria
Prof. Hans-Rudolf Tinneberg, M. D.	Gießen, Germany
Frank Tuttlies, M. D.	Villach, Austria
Prof. Uwe Ulrich, M. D.	Berlin, Germany
Prof. Ludwig Wildt, M. D.	Innsbruck, Austria

Official representatives of the professional associations that have consented

Professional association	Name	Place
German Society for Obstetrics and Gynecology	Prof. Ludwig Kiesel, M. D.	Münster, Germany
	Prof. Hans-Rudolf Tinneberg, M. D.	Giessen, Germany
German Society for General and Visceral Surgery	Prof. Jan Langrehr, M. D.	Berlin, Germany
German Society for Urology	Prof. Jürgen Geschwend, M. D.	Munich, Germany
German Society for Gynecologic Endocrinology and Reproductive Medicine (Working Group of the DGGG)	Prof. Ludwig Kiesel, M. D.	Münster, Germany
Working Group Gynecologic Endoscopy (AGE/DGGG)	Prof. Uwe Ulrich, M. D.	Berlin, Germany
Working Group Gynecologic Oncology (AGO/DGGG)	Prof. Uwe Ulrich, M. D.	Berlin, Germany
German Society for Psychosomatic Obstetrics and Gynecology	Friederike Siedentopf, M. D.	Berlin, Germany
Swiss Society for Obstetrics and Gynecology	Prof. Michel Müller, M. D.	Berne, Switzerland
Austrian Society for Obstetrics and Gynecology	Prof. Jörg Keckstein, M. D.	Villach, Austria
	Prof. Peter Oppelt, M. D.	Linz, Austria
	Wolfgang Stummvoll†, M. D.	Linz, Austria
	Prof. Ludwig Wildt, M. D.	Innsbruck, Austria
Czech Society for Obstetrics and Gynecology	Radek Chvatal, M. D.	Znaim, Czech Republic
	Eduard Kucera, M. D.	Prague, Czech Republic
Endometriosis Research Foundation (SEF)	Prof. Karl-Werner Schweppe, M. D.	Westerstede, Germany
European Endometriosis League (EEL)	Prof. Hans-Rudolf Tinneberg, M. D.	Gießen, Germany
	Stefan P. Renner, M. D.	Erlangen, Germany
Endometriosis Association Germany (self-help)	Dr. Heike Matuszewski	Berlin, Germany
Endometriosis Association Austria (self-help)	Katrin Steinberger	Vienna, Austria

1.6.2 Consulting

Monika Nothacker, M. D., Berlin, Germany (Association of the Scientific Medical Societies of Germany (Arbeitsgemeinschaft der wissenschaftlichen medizinischen Fachgesellschaften)).

1.7 Abbreviations used in this paper

AFS	American Fertility Society
AGE	Arbeitsgemeinschaft Gynäkologische Endoskopie der DGGG (Working Group Gynecologic Endoscopy DGGG)
AGO	Arbeitsgemeinschaft Gynäkologische Onkologie der DGGG und der Deutschen Krebsgesellschaft (Working Group Gynecologic Oncology of the DGGG and the German Cancer Society)
CT	computed tomography
DGGG	Deutsche Gesellschaft für Gynäkologie und Geburtshilfe (German Society for Obstetrics and Gynecology)
DIE	deep infiltrating endometriosis
EEL	Europäische Endometriose Liga (European Endometriosis League)
ENZIAN	name of a hotel in Weissensee, Carinthia (Austria) where the classification of DIE was first established by an SEF expert group in 2002
GnRHa	gonadotropin-releasing hormone analog
HRT	hormone replacement therapy
ICSI	intracytoplasmatic sperm injection
IUD	intrauterine device
IUI	intrauterine Insemination
IVF	in-vitro fertilization
MRI	magnetic resonance imaging
OC	oral contraceptive (orales, hormonelles Antikonzeptivum)
OEGGG	Österreichische Gesellschaft für Gynäkologie und Geburtshilfe (Austrian Society for Obstetrics and Gynecology)
rASRM	(revised) American Society for Reproductive Medicine (-classification)
SEF	Stiftung Endometrioseforschung (Endometriosis Research Foundation)

2 Special Notes

While a company's brand name, or a registered trade mark, respectively, are not necessarily given in the present paper, it must not be presumed that such name or mark was free.

As medical science is a rapidly developing field, informations and recommendations given in these guidelines do represent the state-of-the-art knowledge as it stands at the time of submission of the paper. Utmost care has been taken by the expert panel to extract that knowledge from the scientific literature as well as their personal experience. Having said that, the user remains fully liable for all applications based upon recommendations given in the present paper.

The reader's attention is drawn to the fact that oral contraceptives (OCs) and intrauterine levonorgestrel-releasing systems are not specifically approved in Germany for the treatment of endometriosis. Thus, their therapeutic application for the treatment of endometriosis is made off label.

Finally, this work is fully protected. Any use that infringes the law on copyright without written permission by the editors, authors, and copyright holders, respectively, is prohibited and considered a criminal offense. No part of these guidelines may be reproduced in any form without the written permission of the editors and authors. This applies to photocopies, translations, microfilms, and to the storage, use and processing on electronic media, intranets and the internet.

3 Introduction and General Comments

3.1 Definition and epidemiology

Statements:

- a. Endometriosis – one of the most common gynecologic diseases – is defined as the occurrence of endometrium-like cell formations outside the uterine cavity.
- b. The cardinal symptom is chronic pelvic pain. Infertility is common.

There are about 20 000 hospital admissions per year for endometriosis in Germany (Haas et al. 2012). Pathologically and histologically, endometriosis is a benign disease. However, infiltrative growth into adjacent organs is possible requiring extensive surgical procedures.

3.2 Etiology, pathology, and staging

Statement:

Etiology and pathogenesis of endometriosis are not fully understood. Therefore, a causal therapy is not known to date.

Recommendation:

All staging systems known to date have their limitations. In order to ensure the international comparability of data, the use of the rASRM staging system – and in cases of deep infiltrating endometriosis the additional use of the ENZIAN classification – is recommended.

Endometriosis and malignancy

Statements:

- a. In rare cases, malignancy – usually ovarian cancer – may arise from endometriosis.
- b. Aside from this, the association of other, non-gynecologic malignancies with endometriosis has been described in the litera-

ture. The clinical significance of this observation is not understood.

4 Diagnosis and Treatment of Endometriosis

Statements:

- a. Indications for endoscopic diagnosis and treatment of endometriosis are as follows:
 - ▶ Chronic pelvic pain,
 - ▶ Destruction of organs, and/or
 - ▶ Infertility.
- b. For control of symptoms, the surgical removal of endometriotic lesions is considered as “gold standard” (Abbott et al. 2004, De-guara et al. 2012, Garry 2004).

Recommendations:

In general, the diagnosis of endometriosis is to be established histologically. Hence, diagnostic laparoscopy is essential for the diagnostic work-up (Walter et al. 2001).

4.1 General comments

Some affected women have no symptoms. Also, there is no correlation between stage of the disease and grade of symptoms. Asymptomatic endometriosis in a woman without infertility is no indication of surgical or other medical interventions (exception: endometriosis-related hydronephrosis). Almost every woman with symptomatic endometriosis suffers from dysmenorrhea. If this cardinal symptom is lacking, other differential diagnoses are to be considered (see Guidelines for Chronic Pelvic Pain in Women, AWMF Registry No.016–001, Sillem u. Teichmann 2003, Siedentopf et al. 2009).

4.2 Peritoneal endometriosis

Statements:

- a. The diagnosis of peritoneal endometriosis is made laparoscopically.
- b. Treatment of choice is the laparoscopic removal of the implants.

Recommendation:

Following hormonal suppression of the ovarian function, endometriotic implants may undergo regression. For the reduction of endometriosis-associated symptoms, progestins, OCs, or GnRH analogs may be used in order to induce therapeutic amenorrhea (Abou-Setta et al. Cochrane Review 2013, Brown et al. Cochrane Review 2012, Allen et al. Cochrane Review 2009).

4.3 Ovarian endometriosis (endometriomas)

Statement:

The diagnosis of ovarian endometriomas is primarily made by transvaginal ultrasound.

Recommendations:

- a. For primary treatment of ovarian endometriomas, the cyst wall should be removed surgically. Fenestration alone is considered insufficient.
- b. Endocrine drug treatment alone is neither effective in eliminating an ovarian endometrioma (and, consequently, to replace its surgical removal) – nor in compensating for incomplete surgical removal. Therefore, it is not recommended.

Differential diagnosis

In ovarian endometriomas, often a typical echogenic pattern is found (Hudelist et al. 2009b). However, there are also sonographically complex ovarian masses with heterogeneous appearance making it sometimes difficult to differentiate between functional ovarian cysts on the one side and dermoid cysts, kystomas, or ovarian malignant neoplasms on the other side. If a laparoscopic approach is scheduled in unclear ovarian findings, the DGGG S1 Guidelines for Laparoscopic Surgery of Ovarian Tumors apply (AWMF Registry No. 015–003). Any unclear ovarian mass must be clarified histologically.

As the CA-125 level in endometriosis patients is consistently elevated, its assessment is not recommended routinely. The same applies to the serum level of human epididymal protein (HE4, Lenhard et al. 2011, Zheng and Gao 2012).

4.4 Deep infiltrating endometriosis

Statements:

- Deep infiltrating endometriosis (DIE) is defined as involvement of the rectovaginal septum, vaginal fornix, retroperitoneum (pelvic side wall, parametrium), bowel, ureters, and urinary bladder.
- The primary diagnosis of DIE is made clinically with rectovaginal palpation, inspection with divided specula, vaginal ultrasound, and transabdominal ultrasound of the kidneys being mandatory.

Recommendations:

- For treatment, complete resection of DIE should be performed. Nonetheless, compromises must be made as preservation of fertility often is imperative. Considering that the disease is benign and potentially relevant complications may occur, the extent of resection should be thoroughly discussed and agreed upon with the patient.
- Treatment of DIE should be carried out in specialized centers with a multidisciplinary approach (Ebert et al. 2013).
- If patients with DIE are to be managed conservatively – as well as pre- and postoperatively – sonographic examination of the kidneys is mandatory in order to avoid overlooking silent hydronephrosis. DIE-associated hydronephrosis is an absolute indication of appropriate diagnosis and treatment.

Hormone replacement therapy in patients with endometriosis

Premenopausal patients who have undergone hysterectomy because of endometriosis – proper indication provided – should receive a combined estrogen-progestin HRT. In postmenopause, in view of the fact that there is a potential risk of malignancy (see paragraph on endometriosis-associated malignancy), combined estrogen-progestin HRT – or tibolone – is recommended as well (Moen et al. 2010, Soliman and Hillard 2006). Nonetheless, the problem of breast cancer risk has to be balanced against that – and an individual decision made together with the patient (see also S3 Guidelines for HRT in the peri- and postmenopause, AWMF Registry No. 015–062).

4.5 Adenomyosis

Statement:

The diagnosis of adenomyosis is primarily established clinically by vaginal ultrasonography and/or MRI. Most often, it is only the histological result after hysterectomy that is proving.

Recommendations:

- Given completion of family planning and presence of respective symptoms, hysterectomy can be recommended.
- If the patient opts for preservation of the uterus, a therapeutic amenorrhea may be induced, or a progestin-releasing IUD inserted (Garcia and Isaacson 2011).

5 Endometriosis and Infertility

Statements:

- While a causal relationship has not been resolved yet, endometriosis and infertility are often associated.
- For the treatment of women with both endometriosis and infertility, appropriate skills and experience in infertility surgery, as well as cooperation with centers for reproductive medicine are required.

Recommendations:

- In women with both infertility and endometriosis, the implants should be surgically removed for the improvement of fertility.
- In cases of recurrence, assisted reproductive technologies are superior to repeated surgery in terms of pregnancy rate. In repeat operations for ovarian endometriosis, the surgery-related reduction of ovarian reserve is to be considered.
- Postoperative treatment with GnRH analogs was ineffective in improving spontaneous pregnancy rates and is, therefore, not recommended.
- Any drug treatment for endometriosis alone does not improve fertility and should not be applied from a reproductive-medicine perspective.

6 Psychosomatic Aspects

Recommendation:

Psychosomatic aspects in the treatment of patients with endometriosis should be considered and integrated early on.

7 Complementary and Integrative Treatment Approaches

No statements, no recommendations.

8 Rehabilitation, Follow-up, and Self-help

Statement:

After extensive surgery – especially for deep infiltrating endometriosis, after repeat endometriosis operations, or in patients with chronic pain, there often is a need for rehabilitation.

Recommendation:

This need mentioned should be assessed, and measures of rehabilitation, or after-care, respectively, be initiated.

Affiliations

- ¹ Klinik für Gynäkologie und Geburtshilfe, Martin-Luther-Krankenhaus, Berlin
- ² Tagesklinik Altonaer Straße, Hamburg
- ³ Kinderwunschzentrum Dortmund, Dortmund
- ⁴ Abteilung für Gynäkologie und Geburtshilfe, Landeskrankenhaus, Villach
- ⁵ Klinik für Gynäkologie und Geburtshilfe, Albertinen-Krankenhaus, Hamburg
- ⁶ Abteilung für Gynäkologie und Geburtshilfe, Landesfrauen- und Kinderklinik, Linz
- ⁷ Frauenklinik, Universitätsklinikum Erlangen, Erlangen
- ⁸ Praxisklinik am Rosengarten, Mannheim
- ⁹ vormals Abteilung für Gynäkologie, Krankenhaus der Barmherzigen Schwestern, Linz
- ¹⁰ Endometriosezentrum Ammerland, Westerstede

References

- 1 *Abbott J, Hawe J, Hunter D et al.* Laparoscopic excision of endometriosis: a randomized, placebo-controlled trial. *Fertil Steril* 2004; 82: 878–884
- 2 *Abou-Setta AM, Houston B, Al-Inany HG et al.* Levonorgestrel-releasing intrauterine device (LNG-IUD) for symptomatic endometriosis following surgery. Editorial Group: Cochrane Menstrual Disorders and Subfertility Group. *Cochrane Database Syst Rev* 2013; 1: DOI: 10.1002/14651858.CD005072.pub3
- 3 *Abrao MS, Goncalves MO, Dias Jr. JA et al.* Comparison between clinical examination, transvaginal sonography and magnetic resonance imaging for the diagnosis of deep endometriosis. *Hum Reprod* 2007; 22: 3092–3097
- 4 ACOG Committee Opinion. Endometriosis in adolescents. *Obstet Gynecol* 2005; 105: 921–927
- 5 ACOG Committee on Practice Bulletins – Gynecology. ACOG practice bulletin. Medical management of endometriosis. No. 11, December 1999. Clinical management guidelines for obstetrician-gynecologists. *Int J Gynecol Obstet* 2000; 71: 183–196
- 6 *Adamson GD, Pasta DJ.* Endometriosis fertility index: the new, validated endometriosis staging system. *Fertil Steril* 2010; 94: 1609–1615
- 7 *Alborzi S, Momtahan M, Parsanezhad ME et al.* A prospective, randomized study comparing laparoscopic ovarian cystectomy versus fenestration and coagulation in patients with endometriomas. *Fertil Steril* 2004; 82: 1633–1637
- 8 *Alborzi S, Hamed B, Omidvar A et al.* A comparison of the effect of short-term aromatase inhibitor (letrozole) and GnRH agonist (triptorelin) versus case control on pregnancy rate and symptom and sign recurrence after laparoscopic treatment of endometriosis. *Arch Gynecol Obstet* 2011; 284: 105–110
- 9 *Albrecht H.* Die Endometriose. In: Seitz L, Amreich AI, Hrsg. *Biologie und Pathologie des Weibes*. Bd. IV. Berlin, Innsbruck, München, Wien: Urban & Schwarzenberg; 1955: 190–288
- 10 *Allen C, Hopewell S, Prentice A et al.* Nonsteroidal anti-inflammatory drugs for pain in women with endometriosis. *Cochrane Database Syst Rev* 2009; 15: CD004753
- 11 *American Society for Reproductive Medicine.* Revised American Society for Reproductive Medicine classification of endometriosis. *Fertil Steril* 1997; 67: 817–822
- 12 *Aris A.* Endometriosis-associated ovarian cancer: A ten-year cohort study of women living in the Estrie Region of Quebec, Canada. *J Ovarian Res* 2010; 3: 2
- 13 *Armengol-Debeir L, Savoye G, Leroi AM et al.* Pathophysiological approach to bowel dysfunction after segmental colorectal resection for deep endometriosis infiltrating the rectum: a preliminary study. *Hum Reprod* 2011; 26: 2330–2335
- 14 *Asher-Walsh CJ, Tu JL, Du Y et al.* Location of adenomyosis in total hysterectomy specimens. *J Am Assoc Gynecol Laparosc* 2003; 10: 360–362
- 15 *Ballester M, Chereau E, Dubernard G et al.* Urinary dysfunction after colorectal resection for endometriosis: results of a prospective randomized trial comparing laparoscopy to open surgery. *Am J Obstet Gynecol* 2011; 204: 303.e1–303.e6
- 16 *Barnhart K, Dunsmoor-Su R, Coutifaris C.* Effect of endometriosis on in vitro fertilization. *Fertil Steril* 2002; 77: 1148–1155
- 17 *Bassi MA, Podgaec S, Dias Jr. JA et al.* Quality of life after segmental resection of the rectosigmoid by laparoscopy in patients with deep infiltrating endometriosis with bowel involvement. *J Minim Invasive Gynecol* 2011; 18: 730–733
- 18 *Bazot M, Lafont C, Rouzier R et al.* Diagnostic accuracy of physical examination, transvaginal sonography, rectal endoscopic sonography, and magnetic resonance imaging to diagnose deep infiltrating endometriosis. *Fertil Steril* 2009; 92: 1825–1833
- 19 *Bektaş H, Bilsel Y, Sari YS et al.* Abdominal wall endometrioma; a 10-year experience and brief review of the literature. *J Surg Res* 2010; 164: e77–e81
- 20 *Benaglia L, Somigliana E, Vercellini P et al.* The impact of IVF procedures on endometriosis recurrence. *Eur J Obstet Gynecol* 2010; 148: 49–52
- 21 *Benaglia L, Somigliana E, Santi G et al.* IVF and endometriosis-related symptom progression: insights from a prospective study. *Hum Reprod* 2011; 26: 2368–2372
- 22 *Benschop L, Farquhar C, van der Poel N et al.* Interventions for women with endometrioma prior to assisted reproductive technology. *Cochrane Database Syst Rev* 2010; 11: CD008571
- 23 *Bianchi PHM, Pereira RMA, Zanatta A et al.* Extensive excision of deep infiltrative endometriosis before in vitro fertilization significantly improves pregnancy rates. *J Minim Invasive Gynecol* 2009; 16: 174–180
- 24 *Boileau L, Borie F, Laporte S et al.* Pelvipерitonitis by colorectal perforation in the third trimester of pregnancy after surgery for deep pelvic endometriosis. *Fertil Steril* 2011; 96: e42–e44
- 25 *Borgfeldt C, Andolf E.* Cancer risk after hospital discharge diagnosis of benign ovarian cyst and endometriosis. *Acta Obstet Gynecol Scand* 2004; 83: 395–400
- 26 *Bratby MJ, Walker WJ.* Uterine artery embolisation for symptomatic adenomyosis: mid-term results. *Eur J Radiol* 2009; 70: 128–132
- 27 *Brinton LA, Gridley G, Persson I et al.* Cancer risk after a hospital discharge diagnosis of endometriosis. *Am J Obstet Gynecol* 1997; 176: 572–579
- 28 *Brooks JJ, Wheeler JE.* Malignancy arising in extragonadal endometriosis. *Cancer* 1977; 40: 3065–3073
- 29 *Brown J, Pan A, Hart RJ.* Gonadotropin-releasing hormone analogues for pain associated with endometriosis. *Cochrane Database Syst Rev* 2010; 2: CD008475; DOI: 10.1002/14651858
- 30 *Brown J, Kives S, Akhtar M.* Progestagens and anti-progestagens for pain associated with endometriosis. *Cochrane Database Syst Rev* 2012; 3: CD002122; DOI: 10.1002/14651858
- 31 *Bryant CL, Lunniss PJ, Knowles CH et al.* Anterior resection syndrome. *Lancet Oncol* 2012; 13: e403–e408
- 32 *Busacca M, Fedele L, Bianchi S et al.* Surgical treatment of recurrent endometriosis: laparotomy versus laparoscopy. *Hum Reprod* 1998; 13: 2271–2274
- 33 *Busacca M, Somigliana E, Bianchi S et al.* Post-operative GnRH analogue treatment after conservative surgery for symptomatic endometriosis stage III–IV: a randomized controlled trial. *Hum Reprod* 2001; 16: 2399–2402
- 34 *Busacca M, Vignali M.* Endometrium excision and ovarian reserve: a dangerous relation. *J Minim Invasive Gynecol* 2009; 16: 142–148
- 35 *Butrick CW.* Chronic pelvic pain: how many surgeries are enough? *Clin Obstet Gynecol* 2007; 50: 412–414
- 36 *Camagna O, Dhainaut C, Dupuis O et al.* Chirurgisches Vorgehen bei Endometriose des Septum rectovaginale in einer konsekutiven Serie von 50 Fällen [auf Französisch]. *Gynecol Obstet Fertil* 2004; 32: 199–209
- 37 *Ceccaroni M, Clarizia R, Bruni F et al.* Nerve-sparing laparoscopic eradication of deep endometriosis with segmental rectal and parametrial resection: the Negrar method. A single-center, prospective, clinical trial. *Surg Endosc* 2012; 26: 2029–2045
- 38 *Champaneria R, Abedin P, Daniels J et al.* Ultrasound scan and magnetic resonance imaging for the diagnosis of adenomyosis: systematic review comparing test accuracy. *Acta Obstet Gynecol Scand* 2010; 89: 1374–1384
- 39 *Chapron C, Fritel X, Dubuisson JB.* Fertility after laparoscopic management of deep endometriosis infiltrating the uterosacral ligaments. *Hum Reprod* 1999; 14: 329–332
- 40 *Chapron C, Santulli P, de Ziegler D et al.* Ovarian endometrioma: severe pelvic pain is associated with deeply infiltrating endometriosis. *Hum Reprod* 2012; 27: 702–711
- 41 *Chen ZH, Chen M, Tsai HD et al.* Intrapartum uterine rupture associated with a scarred cervix because of a previous rupture of cystic cervical endometriosis. *Taiwan J Obstet Gynecol* 2011; 50: 95–97
- 42 *Chopin N, Vieira M, Borghese B et al.* Operative management of deeply infiltrating endometriosis: Results on pelvic pain symptoms according to a surgical classification. *J Minim Invasive Gynecol* 2005; 12: 106–112

- 43 Coccia ME, Rizzello F, Mariani G *et al.* Ovarian surgery for bilateral endometriomas influences age at menopause. *Hum Reprod* 2011; 26: 3000–3007
- 44 Cosson M, Querleu D, Donnez J. Dienogest is as effective as triptorelin in the treatment of endometriosis after laparoscopic surgery: results of a prospective, multicenter, randomized study. *Fertil Steril* 2002; 77: 684–692
- 45 Daraï E, Thomassin I, Barranger E *et al.* Feasibility and clinical outcome of laparoscopic colorectal resection for endometriosis. *Am J Obstet Gynecol* 2005; 192: 394–400
- 46 Daraï E, Lesieur B, Dubernard G *et al.* Fertility after colorectal resection for endometriosis: results of a prospective study comparing laparoscopy with open surgery. *Fertil Steril* 2011; 95: 1903–1908
- 47 Davis L, Kenney SS, Moore J *et al.* Modern combined oral contraceptives for pain associated with endometriosis. *Cochrane Database Syst Rev* 2007; 18: CD001019
- 48 Deaton JL, Gibson M, Blackmer KM *et al.* A randomized, controlled trial of clomiphene citrate and intrauterine insemination in couples with unexplained infertility or surgically corrected endometriosis. *Fertil Steril* 1990; 54: 1083–1088
- 49 De Cicco C, Corona R, Schonman R *et al.* Bowel resection for deep endometriosis: a systematic review. *Br J Obstet Gynaecol* 2011; 118: 285–291
- 50 Deguara CS, Pepas L, Davis C. Does minimally invasive surgery for endometriosis improve pelvic symptoms and quality of life? *Curr Opin Obstet Gynecol* 2012; 24: 241–244
- 51 Decker D, König J, Wardelmann E *et al.* Terminal ileitis with sealed perforation – a rare complication of intestinal endometriosis. *Arch Gynecol Obstet* 2004; 270: 230–234
- 52 D'Hooghe TM, Denys B, Spiessens C *et al.* Is the endometriosis recurrence rate increased after ovarian hyperstimulation? *Fertil Steril* 2006; 86: 283–290
- 53 Donnez J, Nisolle M, Gillet N *et al.* Large ovarian endometriomas. *Hum Reprod* 1996; 11: 641–646
- 54 Donnez J, Jadoul P, Colette S *et al.* Deep rectovaginal endometriotic nodules: perioperative complications from a series of 3,298 patients operated on by the shaving technique. *Gynecol Surg* 2013; 10: 31–40
- 55 Douay-Hauser N, Yazbeck C, Walker F *et al.* Infertile women with deep and intraperitoneal endometriosis: comparison of fertility outcome according to the extent of surgery. *J Minim Invasive Gynecol* 2011; 18: 622–628
- 56 Ebert AD, Ulrich U, Keckstein J *et al.* Implementation of certified endometriosis centers: 5-year experience in German-speaking Europe. *Gynecol Obstet Invest* 2013; 76: 4–9
- 57 Elizur SE, Chian RC, Holzer HE *et al.* Cryopreservation of oocytes in a young woman with severe and symptomatic endometriosis: a new indication for fertility preservation. *Fertil Steril* 2009; 91: 293.e1–293.e3
- 58 Fedele L, Bianchi S, Raffaelli R *et al.* Treatment of adenomyosis-associated menorrhagia with a levonorgestrel-releasing intrauterine device. *Fertil Steril* 1997; 68: 426–429
- 59 Fedele L, Bianchi S, Zanonato G *et al.* Use of a levonorgestrel-releasing intrauterine device in the treatment of rectovaginal endometriosis. *Fertil Steril* 2001; 75: 485–488
- 60 Flower A, Liu JP, Lewith G *et al.* Chinese herbal medicine for endometriosis. *Cochrane Database Syst Rev* 2012; 5: CD006568; DOI: 10.1002/14651858
- 61 Ford J, English J, Miles WA *et al.* Pain, quality of life and complications following the radical resection of rectovaginal endometriosis. *Br J Obstet Gynaecol* 2004; 111: 353–356
- 62 Francica G. Reliable clinical and sonographic findings in the diagnosis of abdominal wall endometriosis near cesarean section scar. *World J Radiol* 2012; 4: 135–140
- 63 Fukunishi H, Funaki K, Yamaguchi K *et al.* Early results of magnetic resonance-guided focused ultrasound surgery of adenomyosis: analysis of 20 cases. *J Minim Invasive Gynecol* 2008; 15: 571–579
- 64 Furness S, Yap C, Farquhar C *et al.* Pre and post-operative medical therapy for endometriosis surgery. *Cochrane* 2011; <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003678.pub2/abstract>
- 65 Garcia L, Isaacson K. Adenomyosis: review of the literature. *J Minim Invasive Gynecol* 2011; 18: 428–437
- 66 Garrido N, Navarro J, Garcia Velasco J. The endometrium versus embryonic quality in endometriosis-related infertility. *Hum Reprod Update* 2002; 8: 95–103
- 67 Garry R. The effectiveness of laparoscopic excision of endometriosis. *Curr Opin Obstet Gynecol* 2004; 16: 299–303
- 68 Giudice LC, Kao LC. Endometriosis. *Lancet* 2004; 364: 1789–1799
- 69 Gruppo Italiano per lo Studio dell' Endometriosi. Relationship between stage, site and morphological characteristics of pelvic endometriosis and pain. *Hum Reprod* 2001; 16: 2668–2671
- 70 Gustofson RL, Kim N, Liu S *et al.* Endometriosis and the appendix: a case series and comprehensive review of the literature. *Fertil Steril* 2006; 86: 298–303
- 71 Guzick DS, Silliman NP, Adamson GD *et al.* Prediction of pregnancy in infertile women based on the American Society for Reproductive Medicine's revised classification of endometriosis. *Fertil Steril* 1997; 67: 822–829
- 72 Guzik DS, Huang LS, Broadman BA *et al.* Randomized trial of leuprolide versus continuous oral contraceptives in the treatment of endometriosis-associated pelvic pain. *Fertil Steril* 2011; 95: 1568–1573
- 73 Harada T, Momoeda M, Taketani Y *et al.* Dienogest is as effective as intranasal buserelin acetate for the relief of pain symptoms associated with endometriosis – a randomized, double-blind, multicenter, controlled trial. *Fertil Steril* 2009; 91: 675–681
- 74 Harrison RF, Barry-Kinsella C. Efficacy of medroxyprogesterone treatment in infertile women with endometriosis: a prospective, randomized, placebo-controlled study. *Fertil Steril* 2000; 74: 24–30
- 75 Hart RJ, Hickey M, Maouris P *et al.* Excisional surgery versus ablative surgery for ovarian endometriomata. *Cochrane Database Syst Rev* 2008; 2: CD004992; DOI: 10.1002/14651858
- 76 Haas D, Chvatal R, Habelsberger A *et al.* Comparison of revised American Fertility Society and ENZIAN staging: a critical evaluation of classifications of endometriosis on the basis of our patient population. *Fertil Steril* 2011; 95: 1574–1578
- 77 Haas D, Chvatal R, Reichert B *et al.* Endometriosis – a premenopausal disease? Age pattern in 42,079 patients with endometriosis. *Arch Gynecol Obstet* 2012; 286: 667–670
- 78 Haas D, Chvatal R, Habelsberger A *et al.* Preoperative planning of surgery for deeply infiltrating endometriosis using the ENZIAN classification. *Eur J Obstet Gynecol Reprod Biol* 2013a; 166: 99–103
- 79 Haas D, Shebl O, Shamiyeh A *et al.* The rASRM score and the Enzian classification for endometriosis: their strengths and weaknesses. *Acta Obstet Gynecol Scand* 2013b; 92: 3–7
- 80 Healey M, Ang WC, Cheng C. Surgical treatment of endometriosis: a prospective randomized double-blinded trial comparing excision and ablation. *Fertil Steril* 2010; 94: 2536–2540
- 81 Heaps JM, Nieberg RK, Berek JS. Malignant neoplasms arising in endometriosis. *Obstet Gynecol* 1990; 75: 1023–1028
- 82 Hornstein MD, Yuzpe AA, Burry KA *et al.* Prospective randomized double-blind trial of 3 versus 6 months of nafarelin therapy for endometriosis-associated pelvic pain. *Fertil Steril* 1995; 63: 955–962
- 83 Howard FM. An evidence-based medicine approach to the treatment of endometriosis-associated chronic pelvic pain: placebo-controlled studies. *J Am Assoc Gynecol Laparosc* 2000; 7: 477–488
- 84 <http://www.eshre.eu/ESHRE/English/Specialty-Groups/SIG/Endometriosis-Endometrium/Guidelines/page.aspx/244>
- 85 <http://www.awmf.de>
- 86 Hudelist G, Tuttlies F, Rauter G *et al.* Can transvaginal sonography predict infiltration depth in patients with deep infiltrating endometriosis of the rectum? *Hum Reprod* 2009a; 24: 1012–1017
- 87 Hudelist G, Oberwinkler KH, Singer CF *et al.* Combination of transvaginal sonography and clinical examination for preoperative diagnosis of pelvic endometriosis. *Hum Reprod* 2009b; 24: 1018–1024
- 88 Hudelist G, Keckstein J. Die Wertigkeit der Vaginalsonographie in der präoperativen Diagnostik der Adenomyose und tief infiltrierenden Endometriose. *praxis* 2009; 98: 603–607
- 89 Hudelist G, English J, Thomas AE *et al.* Diagnostic accuracy of transvaginal ultrasound for non-invasive diagnosis of bowel endometriosis: systematic review and meta-analysis. *Ultrasound Obstet Gynecol* 2011; 37: 257–263
- 90 Hudelist G, Fritzer N, Thomas A *et al.* Diagnostic delay for endometriosis in Austria and Germany: causes and possible consequences. *Hum Reprod* 2012; 27: 3412–3416
- 91 Hughes E, Fedorkow D, Collins J *et al.* Ovulation suppression for endometriosis. *Cochrane Syst Rev. Cochrane Library, Issue 1.* Chichester, UK: John Wiley & Sons, Ltd.; 2005
- 92 Jacobson TZ, Duffy JMN, Barlow D *et al.* Laparoscopic surgery for pelvic pain associated with endometriosis. Editorial Group: Cochrane Menstrual Disorders and Subfertility Group. *Cochrane Database Syst Rev* 2009; 4: DOI: 10.1002/14651858.CD001300.pub2

- 93 Jacobson TZ, Duffy JMN, Barlow D et al. Laparoscopic surgery for subfertility associated with endometriosis. Editorial Group: Cochrane Menstrual Disorders and Subfertility Group. Cochrane Database Syst Rev 2010; 1: DOI: 10.1002/14651858.CD001398.pub2
- 94 Jansen RP, Russel P. Nonpigmented endometriosis: clinical, laparoscopic, and pathological definition. Am J Obstet Gynecol 1986; 155: 1154–1159
- 95 Jia SZ, Leng JH, Shi JH et al. Health-related quality of life in women with endometriosis: a systematic review. J Ovarian Res 2012; 5: 29
- 96 Kavallaris A, Mebes I, Evagelinos D et al. Follow-up of dysfunctional bladder and rectum after surgery of a deep infiltrating rectovaginal endometriosis. Arch Gynecol Obstet 2011; 283: 1021–1026
- 97 Keckstein J, Ulrich U, Kandolf O et al. Die laparoskopische Therapie der Darmendometriose und der Stellenwert der medikamentösen Therapie. Zentralbl Gynäkol 2003; 125: 259–266
- 98 Keckstein J, Ulrich U. Endokrine und operative Therapie der Adenomyose. Gynäkol Endokrinol 2004; 2: 11–18
- 99 Kennedy S, Bergqvist A, Chapron C et al.; on behalf of the ESHRE Special Interest Group for Endometriosis and Endometrium Guideline Development Group. ESHRE guideline for the diagnosis and treatment of endometriosis. Hum Reprod 2005; 20: 2698–2704
- 100 Kishi Y, Suginami H, Kuramori R et al. Four subtypes of adenomyosis assessed by magnetic resonance imaging and their specification. Am J Obstet Gynecol 2012; 207: 114.e1–114.e7
- 101 Kissler S, Hamscho N, Zangos S et al. Uterotubal transport disorder in adenomyosis and endometriosis – a cause for infertility. Br J Obstet Gynaecol 2006; 113: 902–908
- 102 Kitawaki J, Kusuki I, Yamanaka K et al. Maintenance therapy with dienogest following gonadotropin-releasing hormone agonist treatment for endometriosis-associated pain. Eur J Obstet Gynecol Reprod Biol 2011; 157: 212–216
- 103 Krüger K, Behrendt K, Niedobitek-Kreuter G et al. Location-dependent value of pelvic MRI in the preoperative diagnosis of endometriosis. Eur J Obstet Gynecol Reprod Biol 2013; DOI: pii:S0301–2115 (13)00093–6
- 104 Kobayashi H, Sumimoto K, Kitanaka T et al. Ovarian endometrioma – risks factors of ovarian cancer development. Eur J Obstet Gynecol Reprod Biol 2008; 138: 187–203
- 105 Kodama H, Fukuda J, Karube H et al. Benefit of in vitro fertilization treatment for endometriosis-associated infertility. Fertil Steril 1996; 66: 974–979
- 106 Kondo W, Bourdel N, Tamburro S et al. Complications after surgery for deeply infiltrating pelvic endometriosis. Br J Obstet Gynaecol 2011; 118: 292–298
- 107 Krüger K, Behrendt K, Balzer M et al. Relevance of MRI for endometriosis diagnosis. Röfo 2011; 183: 423–431
- 108 Kupfer M, Schwimmer S, Lebonic J. Transvaginal sonographic appearance of endometrioma: Spectrum of findings. J Ultrasound Med 1992; 11: 129–133
- 109 Lea R, Bancroft K, Whorwell PJ. Irritable bowel syndrome, chronic pelvic inflammatory disease and endometriosis: a comparison of symptomatology. Eur J Gastroenterol Hepatol 2004; 16: 1269–1272
- 110 Lenhard M, Stieber P, Hertlein L et al. The diagnostic accuracy of two human epididymis protein 4 (HE4) testing systems in combination with CA125 in the differential diagnosis of ovarian masses. Clin Chem Lab Med 2011; 49: 2081–2088
- 111 Leyendecker G, Kunz G, Noe M et al. Endometriosis: a dysfunction and disease of the archimetra. Hum Reprod Update 1998; 4: 752–762
- 112 Leyendecker G, Wildt L, Mall G. The pathophysiology of endometriosis and adenomyosis: tissue injury and repair. Arch Gynecol Obstet 2009; 280: 529–538
- 113 Littman E, Giudice L, Lathi R et al. Role of laparoscopic treatment of endometriosis in patients with failed in vitro fertilization cycles. Fertil Steril 2005; 84: 1574–1578
- 114 Lovrinčević M. Chronic pelvic pain in women of childbearing age. Curr Opin Anaesthesiol 2003; 16: 275–280
- 115 Lusuuardi L, Hager M, Sieberer M et al. Laparoscopic treatment of intrinsic endometriosis of the urinary tract and proposal of a treatment scheme for ureteral endometriosis. Urology 2012; 80: 1033–1038
- 116 Mabrouk M, Ferrini G, Montanari G et al. Does colorectal endometriosis alter intestinal functions? A prospective manometric and questionnaire-based study. Fertil Steril 2012; 97: 652–656
- 117 Marcoux S, Maheux R, Bérubé S. Laparoscopic surgery in infertile women with minimal or mild endometriosis. Canadian Collaborative Group on Endometriosis. N Engl J Med 1997; 337: 217–222
- 118 Matalliotakis I, Mahutte NG, Koukoura O et al. Endometriosis-associated stage IA clear cell ovarian carcinoma in a woman with IVF-ET treatments in the Yale series. Arch Gynecol Obstet 2006; 274: 184–186
- 119 McDermott S, Oei TN, Iyer VR et al. MR imaging of malignancies arising in endometriomas and extraovarian endometriosis. Radiographics 2012; 32: 845–863
- 120 Melin A, Sparen P, Bergqvist A. The risk of cancer and the role of parity among women with endometriosis. Hum Reprod 2007; 22: 3021–3026
- 121 Meredith SM, Sanchez-Ramos L, Kaunitz AM. Diagnostic accuracy of transvaginal sonography for the diagnosis of adenomyosis: systematic review and metaanalysis. Am J Obstet Gynecol 2009; 201: 107.e1–107.e6
- 122 Meuleman C, Tomassetti C, D'Hoore A et al. Surgical treatment of deeply infiltrating endometriosis with colorectal involvement. Hum Reprod Update 2011; 17: 311–326
- 123 Meuleman C, Tomassetti C, D'Hooghe TM. Clinical outcome after laparoscopic radical excision of endometriosis and laparoscopic segmental bowel resection. Curr Opin Obstet Gynecol 2012; 24: 245–252
- 124 Meyer R. Über den Stand der Frage der Adenomyositis, Adenomyome im allgemeinen und insbesondere über Adenomyositis seroepithelialis und Adenomyometritis sarcomatosa. Zentralbl Gynäkol 1919; 36: 745–750
- 125 Minelli L, Fanfani F, Fagotti A et al. Laparoscopic colorectal resection for bowel endometriosis: feasibility, complications, and clinical outcome. Arch Surg 2009; 144: 234–239
- 126 Modugno F, Ness RB, Allen GO et al. Oral contraceptive use, reproductive history, and risk of epithelial ovarian cancer in women with and without endometriosis. Am J Obstet Gynecol 2004; 191: 733–740
- 127 Moini A, Riazii K, Amid V et al. Endometriosis may contribute to oocyte retrieval-induced pelvic inflammatory disease: report of eight cases. J Assist Reprod Genet 2005; 22: 307–309
- 128 Mol BW, Bayram N, Lijmer JG et al. The performance of CA-125 measurement in the detection of endometriosis: a meta-analysis. Fertil Steril 1998; 70: 1101–1108
- 129 Moore J, Copley S, Morris J et al. A systematic review of the accuracy of ultrasound in the diagnosis of endometriosis. Ultrasound Obstet Gynecol 2002; 20: 630–634
- 130 Morita M, Asakawa Y, Nakakuma M et al. Laparoscopic excision of myometrial adenomyomas in patients with adenomyosis uteri and main symptoms of severe dysmenorrhea and hypermenorrhea. J Am Assoc Gynecol Laparosc 2004; 11: 86–89
- 131 Muzii L, Marana R, Caruana P et al. The impact of preoperative gonadotropin-releasing hormone agonist treatment on laparoscopic excision of ovarian endometriotic cysts. Fertil Steril 1996; 65: 1235–1237
- 132 Muzii L, Maneschi F, Marana R et al. Oral estroprogestins after laparoscopic surgery to excise endometriomas: continuous or cyclic administration? Results of a multicenter randomized study. J Minim Invasive Gynecol 2011; 18: 173–178
- 133 Nagle CM, Olsen CM, Webb PM et al.; Australian Cancer Study Group; Australian Ovarian Cancer Study Group. Endometrioid and clear cell ovarian cancers: a comparative analysis of risk factors. Eur J Cancer 2008; 44: 2477–2484
- 134 Nezhat C, Seidman DS, Nezhat F et al. Laparoscopic surgical management of diaphragmatic endometriosis. Fertil Steril 1998; 69: 1048–1055
- 135 Nisolle M, Casanas-Roux BS, Anaf V et al. Morphometric study of the stromal vascularization in peritoneal endometriosis. Fertil Steril 1993; 59: 681–684
- 136 Olson JE, Cerhan JR, Janney CA et al. Postmenopausal cancer risk after self-reported endometriosis diagnosis in the Iowa Women's Health Study. Cancer 2002; 94: 1612–1618
- 137 Opøien HK, Fedorcsak P, Byholm T et al. Complete surgical removal of minimal and mild endometriosis improves outcome of subsequent IVF/ICSI treatment. Reprod Biomed Online 2011; 23: 389–395
- 138 Opøien HK, Fedorcsak P, Omland AK et al. In vitro fertilization is a successful treatment in endometriosis-associated infertility. Fertil Steril 2012; 97: 912–918
- 139 Osada H, Silber S, Kakinuma T et al. Surgical procedure to conserve the uterus for future pregnancy in patients suffering from massive adenomyosis. Reprod Biomed Online 2011; 22: 94–99

- 140 Ozaki T, Takahashi K, Okada M. Live birth after conservative surgery for severe adenomyosis following magnetic resonance imaging and gonadotropin-releasing hormone agonist therapy. *Int J Fertil Womens Med* 1999; 44: 260–264
- 141 Ozel L, Sagioglu J, Unal A et al. Abdominal wall endometriosis in the cesarean section surgical scar: a potential diagnostic pitfall. *J Obstet Gynaecol Res* 2012; 38: 526–530
- 142 Pagidas K, Falcone T, Hemmings R et al. Comparison of reoperation for moderate (stage III) and severe (stage IV) endometriosis-related infertility with in vitro fertilization-embryo transfer. *Fertil Steril* 1996; 65: 791–795
- 143 Parazzini F. Ablation of lesions or no treatment in minimal-mild endometriosis in infertile women: a randomized trial. Gruppo Italiano per lo Studio dell'Endometriosi. *Hum Reprod* 1999; 14: 1332–1334
- 144 Payá V, Hidalgo-Mora JJ, Diaz-García C et al. Surgical treatment of rectovaginal endometriosis with rectal involvement. *Gynecol Surg* 2011; 8: 269–277
- 145 Pearce CL, Templeman C, Rossing MA et al.; on behalf of the Ovarian Cancer Association Consortium. Association between endometriosis and risk of histological subtypes of ovarian cancer: a pooled analysis of case-control studies. *Lancet* 2012; 13: 385–394
- 146 Pepas L, Deguara C, Davis C. Update on the surgical management of adenomyosis. *Curr Opin Obstet Gynecol* 2012; 24: 259–264
- 147 Pereira RMA, Zanatta A, Preti CDL et al. Should the gynecologist perform laparoscopic bowel resection to treat endometriosis? Results over 7 years in 168 patients. *J Minim Invasive Gynecol* 2009; 16: 472–479
- 148 Petraglia F, Hornung D, Seitz C et al. Reduced pelvic pain in women with endometriosis: efficacy of long-term dienogest treatment. *Arch Gynecol Obstet* 2012; 285: 167–173
- 149 Pisanu A, Deplano D, Angioni S et al. Rectal perforation from endometriosis in pregnancy: case report and literature review. *World J Gastroenterol* 2010; 16: 648–651
- 150 Possover M, Diebold H, Plaul K et al. Laparoscopically-assisted vaginal resection of rectovaginal endometriosis. *Obstet Gynecol* 2000; 96: 304–307
- 151 Possover M. Laparoscopic management of neural pelvic pain in women secondary to pelvic surgery. *Fertil Steril* 2009; 91: 2720–2725
- 152 Redwine DB. Diaphragmatic endometriosis: diagnosis, surgical management, and long-term results of treatment. *Fertil Steril* 2002; 77: 288–296
- 153 Renner SP, Rix S, Boosz A et al. Preoperative pain and recurrence risk in patients with peritoneal endometriosis. *Gynecol Endocrinol* 2009; 28: 1–6
- 154 Revidierte ENZIAN Klassifikation. 10. Weissenseetreffen der Stiftung Endometriose Forschung. Weissensee, Kärnten, 25.-27. Februar 2011
- 155 Rickes D, Nickel I, Kropf S et al. Increased pregnancy rates after ultralong postoperative therapy with gonadotropin-releasing hormone analogs in patients with endometriosis. *Fertil Steril* 2002; 78: 757–762
- 156 Rozsnyai F, Roman H, Resch B et al.; CIRENDO Study Group. Outcomes of surgical management of deep infiltrating endometriosis of the ureter and urinary bladder. *JLSL* 2011; 15: 439–447
- 157 Roman H, Rozsnyai F, Puscasiou L et al. Complications associated with two laparoscopic procedures used in the management of rectal endometriosis. *J Soc Laparoendosc Surg* 2010; 14: 169–177
- 158 Roman H, Ness J, Suciú N et al. Are digestive symptoms in women presenting with pelvic endometriosis specific to lesion localizations? A preliminary prospective study. *Hum Reprod* 2012; 27: 3440–3449
- 159 Saleh A, Tulandi T. Reoperation after laparoscopic treatment of endometriomas by excision and fenestration. *Fertil Steril* 1999; 72: 322–324
- 160 Sallam H, Garcia-Velasco J, Dias S et al. Long-term pituitary down-regulation before in vitro fertilization (IVF) for women with endometriosis. *Cochrane Database Syst Rev* 2006; 2: CD004635
- 161 Sampson JA. Peritoneal endometriosis due to menstrual dissemination of the endometrial tissue into the peritoneal cavity. *Am J Obstet Gynecol* 1927a; 14: 422
- 162 Sampson JA. Metastatic or embolic endometriosis due to the menstrual dissemination of endometrial tissue into the venous circulation. *Am J Pathol* 1927b; 3: 93–109
- 163 Sarmini R, Lefholz K, Froeschke H. A comparison of laparoscopic supracervical hysterectomy and total abdominal hysterectomy outcomes. *J Minim Invasive Gynecol* 2005; 12: 121–124
- 164 Schuster MW, Wheeler TL 2nd, Richter HE. Endometriosis after laparoscopic supracervical hysterectomy with uterine morcellation: a case control study. *J Minim Invasive Gynecol* 2012; 19: 183–187
- 165 Schweppe KW. Endometriose – Eine Erkrankung ohne Lobby. *Zentralbl Gynäkol* 2003; 125: 233
- 166 Seracchioli R, Mabrouk M, Frascà C et al. Long-term cyclic and continuous oral contraceptive therapy and endometrioma recurrence: a randomized controlled trial. *Fertil Steril* 2010; 93: 52–56
- 167 Sesti F, Capozzolo T, Pietropolli A, Marziali M, Bollea MR, Piccione E. Recurrence rate of endometrioma after laparoscopic cystectomy: a comparative randomized trial between post-operative hormonal suppression treatment or dietary therapy vs. Placebo. *Eur J Obstet Gynecol Reprod Biol* 2009; 147: 72–77
- 168 Shakiba K, Bena JF, McGill KM et al. Surgical treatment of endometriosis: a 7-year follow-up on the requirement for further surgery. *Obstet Gynecol* 2008; 111: 1285–1292
- 169 Shaw RW. *An Atlas of Endometriosis*. Carnforth-Pearl River: Parthenon Publishing Group; 1993
- 170 Siedentopf F, Hrsg. *Chronischer Unterbauchschmerz der Frau. Leitlinie der Deutschen Gesellschaft für Psychosomatische Frauenheilkunde und Geburtshilfe*. Berlin: Verlag S. Kramarz; 2009
- 171 Sillem M, Teichmann AT. Patientinnenzentrierte Aspekte der Endometriose. *Gynäkologe* 2003; 36: 41–52
- 172 Soliman NF, Hillard TC. Hormone replacement therapy in women with past history of endometriosis. *Climacteric* 2006; 9: 325–335
- 173 Somigliana E, Arnoldi M, Benaglia L et al. IVF-ICSI outcome in women operated on for bilateral endometriomas. *Hum Reprod* 2008; 23: 1526–1530
- 174 Soriano D, Schonman R, Nadu A et al. Multidisciplinary team approach to management of severe endometriosis affecting the ureter: long-term outcome data and treatment algorithm. *J Minim Invasive Gynecol* 2011; 18: 483–488
- 175 Steege JF. Basic Philosophy of the integrated Approach: overcoming the Mind-Body-Split. In: Steege JF, Metzger DA, Levy BS, eds. *Chronic pelvic Pain: an integrated Approach*. Philadelphia: WB Saunders; 1998: 5–12
- 176 Stepińska A, Pomini P, Bruni F et al. Laparoscopic treatment of bowel endometriosis in infertile women. *Hum Reprod* 2009; 24: 1619–1625
- 177 Strowitzki T, Marr J, Gerlinger C et al. Dienogest is as effective as leuprolide acetate in treating the painful symptoms of endometriosis: a 24-week, randomized, multicentre, open-label trial. *Hum Reprod* 2010; 25: 633–641
- 178 Swiersz LM. Role of endometriosis in cancer and tumor development. *Ann NY Acad Sci* 2002; 995: 281–292
- 179 Takamura M, Koga K, Osuga Y et al. Post-operative oral contraceptive use reduces the risk of ovarian endometrioma recurrence after laparoscopic excision. *Hum Reprod* 2009; 24: 3042–3048
- 180 Tietjen GE, Bushnell CD, Herial NA et al. Endometriosis is associated with prevalence of comorbid conditions in migraine. *Headache* 2007; 47: 1069–1078
- 181 Tsoumpou I, Kyrgiou M, Gelbaya TA et al. The effect of surgical treatment for endometrioma on in vitro fertilization outcomes: a systematic review and meta-analysis. *Fertil Steril* 2009; 92: 75–87
- 182 Tummon IS, Asher LJ, Martin JS et al. Randomized controlled trial of superovulation and insemination for infertility associated with minimal or mild endometriosis. *Fertil Steril* 1997; 68: 8–12
- 183 Tuttles F, Keckstein J, Ulrich U et al. ENZIAN-score. Eine Klassifikation der tiefen infiltrierenden Endometriose. *Zentralbl Gynäkol* 2005; 127: 275–281
- 184 Ulrich U, Rhiem K, Kaminski M et al. Parametrial and rectovaginal adenocarcinoma arising from endometriosis. *Int J Gynecol Cancer* 2005; 15: 1206–1209
- 185 Ulrich U, Nawroth F, Dorn C. Endometriose. Klinik, Diagnostik und Therapie. In: Ludwig M, Hrsg. *Gynäkologische Endokrinologie und Reproduktionsmedizin*. München: Hans Marseille Verlag; 2010: 219–227
- 186 Ulrich U, Drienko E, Müller F et al. Chirurgische Therapie der Endometriose: Möglichkeiten und Grenzen. *Med Forsch/Exzellenzforschung in der Medizin* 2012; 3: 56–62
- 187 Van Gorp T, Amant F, Neven P et al. Endometriosis and the development of malignant tumours of the pelvis. A review of literature. *Best Pract Res Clin Obstet Gynaecol* 2004; 18: 349–371

- 188 Van Holsbeke C, Van Calster B, Guerriero S *et al.* Endometriomas: their ultrasound characteristics. *Ultrasound Obstet Gynecol* 2010; 35: 730–740
- 189 Vercellini P, Vendola N, Bocciolone L *et al.* Laparoscopic aspiration of ovarian endometriomas. Effect with postoperative gonadotropin-releasing hormone agonist treatment. *J Reprod Med* 1992; 37: 577–580
- 190 Vercellini P, Trespidi L, Colombo A *et al.* A gonadotropin-releasing hormone agonist versus a low-dose oral contraceptive for pelvic pain associated with endometriosis. *Fertil Steril* 1993; 60: 75–79
- 191 Vercellini P, Trespidi L, De Giorgi O *et al.* Endometriosis and pelvic pain: relation to disease stage and localization. *Fertil Steril* 1996; 65: 299–304
- 192 Vercellini P, Frontino G, DeGiorgi O. Continuous use of an oral contraceptive for endometriosis-associated recurrent dysmenorrhea that does not respond to a cyclic pill regimen. *Fertil Steril* 2003a; 80: 560–563
- 193 Vercellini P, Aimi G, Busacca M *et al.* Laparoscopic uterosacral ligament resection for dysmenorrhea associated with endometriosis: results of a randomized, controlled trial. *Fertil Steril* 2003b; 80: 310–319
- 194 Vlahos NF, Kalampokas T, Fotiou S. Endometriosis and ovarian cancer: a review. *Gynecol Endocrinol* 2009; 28: 1–7
- 195 Vlahos NF, Economopoulos KP, Fotiou S. Endometriosis, in vitro fertilisation and the risk of gynaecological malignancies, including ovarian and breast cancer. *Best Pract Res Clin Obstet Gynaecol* 2010; 24: 39–50
- 196 Volpi E, Peano E, Ferrero A *et al.* Association between ovarian endometriosis and malignancy in the peri-menopausal period: report of two cases and review of the literature. *Gynecol Surg* 2008; 7: 13–17
- 197 Wada S, Kudo M, Minakami H. Spontaneous uterine rupture of a twin pregnancy after a laparoscopic adenomyomectomy: a case report. *J Minim Invasive Gynecol* 2006; 13: 166–168
- 198 Walter AJ, Hentz JG, Magtibay PM *et al.* Endometriosis: correlation between histologic and visual findings at laparoscopy. *Am J Obstet Gynecol* 2001; 184: 1407–1411
- 199 Wiesender CCT. Pelvic Pain Clinic: a multidisciplinary Approach. In: Li TC, Ledger WL, ed. *Chronic pelvic Pain*. Abingdon-Oxford: Taylor & Francis; 2012: 197–210
- 200 Yeung Jr. P, Sinervo K, Winer W *et al.* Complete laparoscopic excision of endometriosis in teenagers: is postoperative hormonal suppression necessary? *Fertil Steril* 2011; 95: 1909–1912
- 201 Yu HT, Huang HY, Soong YK *et al.* Laparoscopic ovarian cystectomy of endometriomas: surgeons' experience may affect ovarian reserve and live-born rate in infertile patients with in vitro fertilization-intracytoplasmic sperm injection. *Eur J Obstet Gynecol Reprod Biol* 2010; 152: 172–175
- 202 Zanetta GM, Webb MJ, Li H *et al.* Hyperestrogenism: a relevant risk factor for the development of cancer from endometriosis. *Gynecol Oncol* 2000; 79: 18–22
- 203 Zheng H, Gao Y. Serum HE4 as a useful biomarker in discriminating ovarian cancer from benign pelvic disease. *Int J Gynecol Cancer* 2012; 22: 1000–1005
- 204 Zhu X, Proctor M, Bensoussan A *et al.* Chinese herbal medicine for primary dysmenorrhoea. *Cochrane Database Syst Rev* 2008; 16: CD005288
- 205 Zhu X, Hamilton KD, McNicol ED. Acupuncture for pain in endometriosis. *Cochrane Database Syst Rev* 2011; 9: CD007864; DOI: 10.1002/14651858
- 206 Zilberman S, Ballester M, Touboul C *et al.* Partial colectomy is a risk factor for urologic complications of colorectal resection for endometriosis. *J Minim Invasive Gynecol* 2013; 20: 49–55
- 207 Zupi E, Marconi D, Sbracia M *et al.* Add-back therapy in the treatment of endometriosis-associated pain. *Fertil Steril* 2004; 82: 1303–1308