Premature ejaculation is the most common problem affecting sexual function in men (1–3) and is insufficiently understood. It is subject to cultural and socioeconomic influences, which makes an exact definition difficult. Difficulties with the definition and divergent study designs hamper the collection of prevalence data and are the cause for the wide spread in the literature (1–3). Often, premature ejaculation is regarded as a primarily psychoreactive problem. Neurobiological components and optional drug treatment are often not being considered.

Objectives and methods
This article presents an overview of the diagnostic and therapeutic options for premature ejaculation. Particular attention has been paid to the difficulty of finding a definition and to prevalence, etiology, risk factors, diagnostics, and therapy. The literature search was performed on PubMed in March 2007, without a time limit and using the search terms premature ejaculation, prevalence, etiology, diagnostics, therapy. Results: A thorough sexual history is mandatory in order to evaluate the potential causes of PE. Although the exact etiology of PE is not fully understood it is becoming increasingly clear that this condition has a neurophysiological, psychogenic, and psychological element, with probable serotonin involvement. Effective treatment requires a thorough understanding of the underlying pathophysiology. Besides psychotherapy there are effective treatments, which can significantly improve the patient’s sexual quality of life.

Definition
In addition to quantifiable and reproducible traits, such as the ejaculatory latency time and the personal mental trauma of one or both partners should be taken into consideration. Premature ejaculation is mostly defined as a deviation from the normal length of intravaginal ejaculatory latency time (IELT). This is the time from penetration to ejaculation. According to Masters and Johnson, who formulated one of the first definitions in the 1970s, premature ejaculation is the inability to delay the moment of ejaculation long enough so that the women reaches orgasm in 50% of sexual encounters (3). Control over the moment of ejaculation...
and sexual satisfaction of the man and woman are possible components and are included in the standard classification systems and guidelines of large urological organizations (4, 5).

Definitions of premature ejaculation in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), International Classification of Diseases (ICD-10), and others generally mention 3 central aspects (ε1, ε2):

- Shortened intravaginal ejaculatory latency time
- Loss of deliberate control of ejaculation
- Mental trauma in man or woman.

The suffering of the partner is mentioned only in DSM-IV and the guidelines of the American Urological Association (AUA) (table 1).

The sensation of what is “normal” varies and is highly subjective. The average time from penetration to ejaculation perceived as normal is 7 to 14 min and shows geographical variations. Women mostly estimate the time as slightly shorter (table 2) (6).

Waldinger et al. found a median IELT of 5.4 min (diagram 1) in 491 men from 4 European countries and the United States (7). Analyzed by country, age, circumcision status, and use of condoms, the IELT was significantly shorter in older men (>51 years) and in men of Turkish origin; sexual intercourse took place a median of 8 times per month in all subgroups (7). If the 0.5th and 2.5th percentile are chosen to define the disorder, the resulting range is 0.9 to 1.3 min. Questionnaires can be used as an instrument for standardized psychometric recording. Validated questionnaires are the IPE (index of premature ejaculation) (8) and the Arab IPE (ε3). The IPE comprises 10 items to describe sexual satisfaction, ejaculatory control, and mental trauma. The partner’s sexual satisfaction is not included. In combination with

---

**TABLE 1**

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSM-IV</td>
<td>Persistent or repeated ejaculation with minimal sexual stimulation before or shortly after penetration and before the person desired this. This state of affairs must cause noticeable mental trauma or interpersonal difficulties.</td>
</tr>
<tr>
<td>ICD-10</td>
<td>An inability to control ejaculation sufficiently, so that both partners enjoy the sexual act, because ejaculation occurs before or very shortly after starting intercourse (if a time limit is required, within 15 s) or because ejaculation occurs in the absence of an erection sufficient for intercourse. The problem is not due to prolonged sexual abstinence.</td>
</tr>
<tr>
<td>EAU guidelines</td>
<td>An inability to control ejaculation for a sufficient time span before vaginal penetration. This does not result in impaired fertility if intravaginal ejaculation occurs.</td>
</tr>
<tr>
<td>AUA guidelines</td>
<td>Ejaculation that occurs earlier than desired, either before or shortly after penetration, and which results in mental trauma for one or both partners.</td>
</tr>
</tbody>
</table>

* From (4, 5, 6, ε2); AUA, American Urological Association; EAU, European Association of Urology

**TABLE 2**

<table>
<thead>
<tr>
<th>Country (n = m/w)</th>
<th>Estimated IELT for men (mins)</th>
<th>Estimated IELT for women (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA (606/300)</td>
<td>13.6</td>
<td>11.2</td>
</tr>
<tr>
<td>United Kingdom (315/222)</td>
<td>9.9</td>
<td>8.5</td>
</tr>
<tr>
<td>France (301/203)</td>
<td>9.3</td>
<td>8.4</td>
</tr>
<tr>
<td>Germany (328/201)</td>
<td>6.9</td>
<td>7.4</td>
</tr>
<tr>
<td>Italy (304/206)</td>
<td>9.6</td>
<td>8.6</td>
</tr>
</tbody>
</table>
the time measurements of the IELT, two tools are therefore available to capture the pathology of premature ejaculation. Questionnaire and time measurements do not reflect real conditions – in practice, personal mental trauma is crucial.

In the Second International Consultation on Erectile and Sexual Dysfunction (e4), "early ejaculation" or "rapid ejaculation" are suggested as replacement terms for "premature ejaculation." Another possible term might be "premature orgasm", because ejaculation is not impared; the problem is that the orgasm reflex is triggered too early. In addition to the exclusively premature orgasm, another type of orgasm could be differentiated that is associated with erectile dysfunction. The secondary form occurs as a result of erectile dysfunction or reduction in sexual appetite.

**Prevalence**

In the Global Study of Sexual Attitudes and Behaviours (GSSAB) (1, 2), the frequency of premature ejaculation was investigated. This study included 27,500 men and women aged 40 to 80 worldwide. It is regarded as the largest epidemiological study of sexuality and its dysfunctions. The GSSAB reported prevalence rates of up to 30%. Geographical differences should be considered in the sociocultural context of the different countries. In selected patients, prevalence rates of far higher than 50% were found (e5, e6).

**Geographical and regional differences**

In the GSSAB, premature ejaculation is the most common sexual dysfunction; its prevalence is highest in Asia, Central America, and South America (diagram 2) (2). The explanation for the high prevalence rates is the importance placed on female sexuality in these societies (9, 10). In spite of patriarchal social structures and low described sexual activity (9), East Asia has the Tantric and Taoist philosophies as its cultural or ideological foundation. In their sexual traditions, the female organism is their central element (10). Coupled with this is the perception among men that ejaculation that happens too early is a problem. The coexistence of premature ejaculation and female anorgasmia supports this observation (diagram 2).

**Other factors**

Erectile dysfunction can be regarded as a comorbidity, cause, or effect or premature ejaculation. An association of premature ejaculation with low educational attainment has also been described (2). Men without academic qualifications in Central America and South America and in the Middle East are at doubly the risk of developing premature ejaculation. In the Middle East, a difficult financial situation seems to have a negative influence (2). Irregular sexual intercourse can lead to premature ejaculation, as is confirmed by the GSSAB.

**Etiology and risk factors**

Psychogenic and organic components can have a role in the etiology of premature ejaculation. Anxiety disorders can have a key role in its development (11). A causal connection between fear and male sexual dysfunction has not been confirmed to date. Whether anxiety disorders are the sequelae or cause of premature ejaculation is not clear (12). The fear of premature orgasm can reduce a couple's sexual pleasure (3, 8, 9). There are further psychological risk factors that are associated with premature ejaculation. The most commonly named is sexual inexperience, scarce sexual activity, and fearfulness (3). Organ related risk factors include urinary tract infections and diabetes mellitus (e7). The side effects of some medical drugs – for example, opiates and sympathomimetics – can result in premature ejaculation (e8). The most common comorbidity, at up to 30%, is erectile dysfunction (13, 14). This should be treated as a priority.

**The role of serotonin in the ejaculatory process**

In addition to hormones, several neurotransmitters influence sexual activity and the ejaculatory process. A raised serotonin concentration in the brain in humans and rats raises the threshold to ejaculation (e9). The impairment of male sexuality was ascribed to serotonergic neurons of the medial raphe nuclei, whose inhibitory function is also responsible for the refractory period between ejaculations (e10). Non-selective activation of serotonin receptors results in dose dependent prolongation of the ejaculatory latency period up to anejaculation (15).
Diagnosis is problematic. For clinical practice, qualitative and quantitative features have been developed, which are not fully established. Only some men with premature ejaculation receive medical help (16). Most men with sexual disorders would welcome talking to a doctor, but only a small proportion is willing to initiate the conversation themselves (16, e11).

The GSSAB study showed that only 18% of men with a sexual problem had received medical advice (1). According to another study, only 1% of men aged above 40 years reported having received medical advice about their premature ejaculation, although they had told the treating physician about their problem (1). Similar results emerged from a large, anonymous, multinational internet study (17). It may be assumed that fewer patients receive advice for premature ejaculation than for erectile dysfunction (18). A detailed sexual history is of the utmost importance; this should include questions about sexual experiences, sexual development, and avoidance strategies already deployed. The extent to which the fear of premature orgasm impairs sexual pleasure should also be investigated (16). The history is part of the therapeutic conception because it provides a setting in which it is safe to admit whether the orgasm is associated with negative emotions.

If the time between insertion of the penis and ejaculation is less than 2 min as a rule, the definition of the pathology premature ejaculation is met (7). In clinical practice, premature ejaculation is diagnosed especially when the deliberate control of ejaculation fails and the relationship suffers as a result.
Therapy

Among underlying physical causes for premature ejaculation, psychoreactive elements play a central part. Drug treatment targets the symptoms. Psychotherapeutically, established behavioral therapies should be used (3, e11, e13). If possible, the partner should be included.

For couple therapy, it is helpful if the patient is in a steady relationship, if the sexual problems are experienced as a central obstacle to a satisfying relationship, and if both partners are interested in the treatment. Approaching the problem together can even be enough to bring about the desired result in some cases and supports all subsequent measures. This may help reduce the pressure for success – for example, by recommending sexual activity without actual intercourse as a first step.

Controlled studies exist for all forms of therapy (box 1). The different study designs, however, hinder the interpretation of drug treatments that are given in accordance with the AUA guidelines of 2004 (e15). An exception is dapoxetine, as controlled studies have been published only since 2004 and have a higher level of evidence; only very few studies cover vardenafil and tadalafil.

For some men, a preceding orgasm is helpful in delaying ejaculation. In some cases, sex therapy is an option to increase a man's sensitivity to the moment of ejaculation. The men affected can learn through different techniques to experience as well as influence the process up to the point that they perceive as inevitable. The stop-start method (e13) and the

**Box 1**

**Therapy**

- Strengthen the man’s physical sensitivity
  - Stop-start method
  - Squeeze method
- Psychotherapy/sexual therapy
- Drug treatment
  - Local: lidocaine, prilocaine
  - Systemic: antidepressants: clomipramine, selective serotonin reuptake inhibitors (fluoxetine, sertraline, paroxetine, and dapoxetine) and phosphodiesterase-5 inhibitors (sildenafil, vardenafil, tadalafil)

**Diagram 3**

Squeeze technique: the ejaculatory reflex is interrupted by applying pressure in the frenulum area with the tip of the thumb. The figure shows the use of the squeeze technique with the help of a partner.
squeeze method recommended by Masters and Johnson (3) have proved successful in treatment, but even these are not uncontroversial.

In the literature, most studies of premature ejaculation are neither prospective, randomized, controlled, blinded, nor quantified by IELT measurement and therefore do not meet the strict criteria of evidence based studies (e14). Small cohort studies of patients without long term follow-up exist (e14). An AUA committee complied guidelines in 2004, which were accepted by a consensus (e15).

Stop-start method
This method aims to teach men to experience their own sexual arousal more clearly and control it. In a first step, the man masturbates and then stops masturbating shortly before the critical threshold, the point of no return. Further stimulation is avoided (stop signal) until the patient has returned to a notably lower level of arousal. The then sexual stimulus is renewed. The patient repeats the stop-and-start steps until he manages a certain degree of control over his arousal (e13).

Squeeze method
The squeeze method is a modified stop-start exercise and aims to teach the man to experience his arousal consciously by means of sensuality training. Afterwards he learns to realize the moment at which ejaculation is imminent more precisely and in a further step, he learns to influence this. By applying pressure with the tip of the thumb to the frenulum area, the ejaculatory reflex is interrupted (diagram 3) (3). In optimal circumstances, the exercises should be used in a relaxed atmosphere in the setting of couple therapy.

Masters and Johnson (3) in 1970 reported on 186 men who were treated with different behavioral approaches, including the squeeze technique. The success rate immediately after therapy was 90%. Other working groups did not achieve such high rates (e12). Hawton et al (e12) reported success rates of 64% immediately after behavioral therapies. All long term reports confirm, however, that after therapy has concluded the problem of premature ejaculation has a tendency to resurface (19).

Drug therapy
In cases where psychotherapy has been insufficiently successful or not had any success at all, several drugs can be administered.

Local anesthetics (such as lidocaine or prilocaine) are applied to the glans and reduce the excitability of the penis (e16). The effect usually sets in after about 20 min, but during

---

**BOX 2**

**Summary**

- Premature ejaculation is the most common problem in sexual function in men and is subject to strong cultural influences.
- Premature ejaculation is defined as a shortened intravaginal ejaculatory latency time, the loss of deliberate ejaculation control, and it is characterized by personal mental trauma of those affected.
- Diagnostics include a thorough sexual history, eliciting the extent of suffering mental trauma, and if required the couple’s dynamic and importance of sexuality.
- Psychotherapeutically, established therapies with different approaches from the armamentarium of sexual therapies are used – the stop-start method and the squeeze method after Masters and Johnson.
- Drug treatments include local anesthetics, antidepressants such as clomipramine and SSRIs, and PDE-5 inhibitors.
intercourse, the partner’s sensations may also become impaired. In double blinded, randomized, placebo controlled studies, IELT of longer than 5 min have been reported, as has greatly improved patient satisfaction (20, e17, e18). All oral drug therapies are off label, and the dosages differ from those given in licensed indications.

Psychopharmaceuticals such as clomipramine and selective serotonin reuptake inhibitors (SSRIs)-such as fluoxetine, sertraline, or paroxetine – should be taken several hours before sexual intercourse, so as to delay the time to ejaculation. Paroxetine is most efficacious (21). According to a prospective, double blinded, randomized, crossover study, all drugs mentioned prolong the IELT significantly (22). These drugs and the local anesthetics mentioned earlier were therefore included as therapeutic options in US guidelines (e15). Dapoxetine is still going through the licensing process; its effect onset is rapid and its half life is short (23).

In men who took the drug as needed, ejaculation was delayed significantly, by 3 min, in a randomized, double blinded, placebo controlled, phase 3 study (23). The study included 2614 men who took either 30 mg or 60 mg dapoxetine in the treatment group.

Since 2001, studies have become available that investigated treatment for premature ejaculation with phosphodiesterase-5 (PDE-5) inhibitors (sildenafil, and more recently also vardenafil and tadalafil), either alone or in combination with SSRIs. Most of these studies are, however, not double blinded and placebo controlled, and often the IELT was not measured (24). This limits the study conclusions with regard to efficacy and comparability. Salonia et al, in a prospective study, compared the efficacy of paroxetine alone or in combination with sildenafil in 80 potent patients with premature ejaculation (25). The combination of paroxetine and sildenafil improved the IELT significant to more than 5 min, compared with paroxetine alone (25). Results from other studies are equally encouraging (22, 23, 24). The AUA guidelines mention only sildenafil (5). Individual studies of vardenafil and tadalafil were published only after these guidelines in 2004. Because of their low side effect profile and the fact that they can be taken when needed, PDE-5 inhibitors may be used to treat premature ejaculation, especially if the patient also has erectile dysfunction.

---

**Short case report**

A 67 year old, married, successful businessman, whose hypertension has been well controlled for years, reports having experienced premature ejaculation. Recently, sexual intercourse has been possible at most once a month, in a “quickie” fashion, if his partner stimulates him maximally; he then ejaculates in seconds. The wife has been sympathetic and does not think that sex is the most important thing in life.

**Relevant findings**

No findings on abdominal, genital, and rectal examination on physical examination, international index for erectile function (IIEF): 15 points (normal >25 points), RR 140/95 mm Hg, testosterone, prolactin, full blood count, thyroid stimulating hormone, and blood glucose all in the normal range.

**Medication**

AT1 blocker

**Methods**

Sexual therapy for the couple was recommended so that both partners learnt to express their desires. In parallel, a controlled attempt was made with PDE-5 inhibitors at a medium dosage because of suspected secondary premature ejaculation. The cost problems were discussed with the patient.

**Verlauf**

Sex therapy over 3 months improved both partners’ ability to articulate their sexual desires. Erections improved in quality thanks to PDE-5 inhibitor treatment, and the medication is required only occasionally. The premature ejaculation improved throughout the couple therapy, so that the patient does not experience a related mental trauma.
Drug treatment cannot cure premature ejaculation; the problem continues to exist after the drugs have been stopped. Because of possible negative side effects, they should therefore be used only as a measure of last resort.

Conclusions
Premature ejaculation is the commonest sexual disorder in men. Patients do not address their problem often enough in the setting of a medical consultation. In clinical practice, a diagnosis can be made by taking a targeted sexual history. Currently, no causal treatment is known. Some therapies are promising. In addition to psychotherapeutic and behavioral measures, antidepressants such as SSRIs, and phosphodiesterase-5 inhibitors have been used successfully (box 2). Suitable treatment improves the patient’s quality of life and often has a positive effect on the relationship (short case report).

Conflict of Interest Statement
Dr Schmitges receives financial support from Bayer-Schering. Professor Sommer receives financial support from Bayer-Schering and Pfizer. Dr Mathers and Professor Klotz declare that no conflict of interest exists according to the Guidelines of the International Committee of Medical Journal Editors.

REFERENCES
For e-references please refer to the additional references listed below.


ADDITIONAL REFERENCES


Corresponding author
Dr. med. Michael J. Mathers, FEBU
Fastenrathstr. 1
42853 Remscheid, Germany
drmathers@urologie-remseheid.de