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Katharina Harter, Gertrud Hammel, Megan Fleming, Claudia Traidl-Hoffmann

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Multiple chemical sensitivity (MCS) – a guide for dermatologists on how to manage affected individuals

Katharina Harter^{1,2}, Gertrud Hammel^{1,2}, Megan Fleming^{1,2,3}, Claudia Traidl-Hoffmann^{1,2,3}

(1) Chair and Institute of Environmental Medicine, UNIKA-T, Medical Faculty of the Technical University Munich and Helmholtz Center Munich, Augsburg, Germany

(2) Christine Kühne Center for Allergy Research and Education (CK-CARE), Davos, Switzerland

(3) Outpatient Clinic for Environmental Medicine at Augsburg University Medical Center, Augsburg, Germany

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Summary

Multiple chemical sensitivity (MCS) is a condition characterized by a subjectively perceived increase in sensitivity to environmental chemicals. Individuals affected report a wide variety of nonspecific complaints, and frequently attribute cutaneous and mucosal symptoms to chemical exposures. Dermatologists should therefore be familiar with this condition. MCS is a diagnosis of exclusion. Other causes for the patients' symptoms should be ruled out by routine laboratory tests, allergy tests and, if indicated, monitoring for toxic (environmental) substances. The primary job of dermatologists is to rule out skin diseases or hypersensitivities as possible causes of the complaints. Interdisciplinary patient management is essential, especially in severe cases in which those affected have problems coping with everyday life. Relevant specialties in this context include environmental medicine, psychosomatic medicine as well as occupational and social medicine. Cutaneous symptoms are usually addressed with symptomatic treatment using basic skin care products. There are currently no evidence-based treatment recommendations for MCS. It is crucial that MCS patients be protected from unnecessary treatments and thus from mental, social and financial strain. In addition to medical skills, managing MCS patients requires communicative and psychosocial competence in particular. Physicians involved in the treatment will benefit from training in psychotherapy. Irrespective of the mechanisms that lead to MCS, diagnosis and treatment of this condition require an actively supportive attitude towards these patients, a good doctor-patient relationship and interdisciplinary cooperation.

Introduction

Patients with multiple chemical sensitivity (MCS, also referred to as “idiopathic environmental intolerance”) describe themselves as “canaries” [1]. Similar to the birds previously used to warn coal miners of carbon monoxide (CO), as they would stop whistling in the presence of even small CO levels, individuals with MCS respond particularly sensitively to perceptible environmental substances.

Symptoms

Patients with MCS present with nonspecific symptoms following exposure to a wide range of environmental substances and noxious agents. In Germany, these substances include wood preservatives, solvents, insecticides, heavy metals, disinfectants and fragrances [2]. Symptoms such as pruritus or a burning sensation of the skin, dry mouth, fatigue, dyspnea or anxiety are triggered by very low

MCS refers to a condition in which affected individuals develop nonspecific symptoms following exposure to very low levels of (primarily anthropogenic) environmental agents.

Medical examination of MCS patients shows no specific trigger for their symptoms.

The pathomechanisms involved in MCS are currently unknown.

levels that otherwise cause no reaction in healthy individuals [3]. Given the large interindividual differences in threshold levels, there are no generally accepted values.

Pathogenesis

Medical examination of MCS patients shows no specific trigger for their symptoms. The objective findings do not support the patients' self-diagnosis and are therefore inconsistent with their subjective well-being. Affected individuals frequently develop symptoms to multiple chemically unrelated, predominantly synthetic substances. Very rarely, patients may also present with a diffuse clinical picture in which their symptoms are triggered by multiple natural and anthropogenic environmental agents. Our own experience shows that this primarily occurs in patients with long-standing or advanced disease. The exact pathomechanisms resulting in clinical symptoms following exposure to a given trigger are currently unknown.

Proposed hypotheses on the pathogenesis of MCS include aspects such as classical conditioning [4, 5], negative affect [6], physical stress reactions [7], cultural imprinting [8, 9], toxicant-induced loss of tolerance [10] and altered central processing of stimuli [11–13]. A multifactorial model has also been proposed [14]. In particular, it remains unclear whether MCS is primarily a psychosomatic condition in which mental factors precede the physical complaints. On the other hand, it may also be possible that MCS is primarily a somato-psychological disorder in which somatic processes (e.g., conditioning) occur prior to the mental sequelae. According to the biopsychosocial disease model, MCS may also represent a "circular", dynamic condition characterized by the interaction of psychosocial, ecological and biological processes (see Fuchs [15] or Egger [16]). Only the definitive elucidation of the underlying pathophysiology will show whether MCS is primarily a psychosomatic, somato-psychological or "circular" condition. Given these uncertainties, some MCS patients advocate for more research into the effects of chemicals on humans and for a reduction in the use of chemical agents in everyday life. This includes dedicated online forums [17].

Epidemiology

As MCS is characterized by subjective symptoms and is diagnostically challenging, the prevalence of this disorder is difficult to estimate. In 2005, a nationwide German survey was conducted to obtain epidemiological data on subjective (multiple) chemical sensitivity [18]. Overall, 2,032 individuals > 15 years were surveyed. Nine percent of the respondents attributed their complaints to chemical exposures [18]. The condition was particularly common among women and above-45-year-olds [18]. The self-reported prevalence of medically diagnosed MCS in the total sample was 0.5 % [18]. Despite the difficulties in arriving at a good estimate of the prevalence of MCS, the available data suggests that more than 300,000 adults may possibly be affected in Germany. While the prevalence of self-reported chemical sensitivity is comparable to other Western societies (e.g., USA), the medical diagnosis of MCS is considerably less common in Germany. Possible reasons may include skepticism towards the diagnosis or lack of familiarity with this syndrome on the part of German physicians [18]. However, there may also be actual differences between various countries, for example, in terms of genetic disposition, chemical exposures or public perception [18].

The prevalence of MCS is estimated at approximately 0.5 %.

Psychosocial situation of affected individuals

In addition individuals with MCS suffer from perceived stigmatization, impaired quality of life and psychosocial comorbidities.

Apart from physical complaints, individuals with MCS are commonly burdened by their psychosocial situation, and their quality of life is significantly impaired. Patients frequently feel stigmatized and not taken seriously [19]. In addition, many of those affected by MCS are no longer able to work or participate in public life due to their condition [20]. Mental disorders are very common among MCS patients, with nearly 80 % thereof being affected [21]. The presence of additional subjective somatic symptoms allows for the distinction between MCS and genuine psychiatric diseases [22].

Relevance of MCS for dermatologists

Given that environmental factors are responsible for triggering the symptoms in patients with MCS, the condition is considered an environmental disease. The skin is a barrier between humans and their environment, which is why MCS patients frequently attribute any cutaneous symptoms to their disorder. Unclear skin findings require a diagnostic workup. Allergic diseases should be ruled out. This practical guide is intended to assist dermatologists in the management of patients with MCS. We will discuss whether and how MCS can be diagnosed and treated, and address general aspects to be observed when managing MCS patients.

Making a definitive diagnosis of MCS is challenging

As there is no accepted definition of MCS and its causes, diagnostic classification remains challenging.

Although first described by the allergist Theron G. Randolph in the 1960s, no accepted definition of the symptomatology and causes of MCS have been established since then [3, 23]. This renders it difficult to make an unequivocal diagnosis and frequently leaves non-experts with a feeling of arbitrariness. Table 1 shows the 1999 consensus criteria for the definition of MCS published by Bartha et al. [24].

Interdisciplinary workup is recommended.

Apart from observing these criteria, it is recommended to perform a simultaneous biopsychosocial diagnostic evaluation of both somatic and psychosocial factors, thus necessitating an interdisciplinary workup of somatic and psychosocial causes of the disorder by appropriate specialists [25]. However, the label “MCS” should always be used with caution [26].

Table 1 Consensus criteria for the definition of multiple chemical sensitivity (MCS) (modified after [24]).

1	Symptoms are reproducible with repeat chemical exposure.
2	It is a chronic condition.
3	Symptoms are triggered by low exposure levels that are usually tolerated by other people, or that used to be tolerated prior to the onset of the condition.
4	Symptoms improve or abate completely when the triggers are avoided or removed.
5	Symptoms are triggered by various chemically unrelated agents.
6	Symptoms involve multiple organs or organ systems.
a	The diagnosis of MCS shall be made If all criteria (1–6) are fulfilled, even if there are other diagnoses (e.g., asthma, allergies, migraine) that lead to fulfillment of some of the criteria.
b	MCS is ruled out when all symptoms (entire spectrum) can be explained by a disorder in the patient’s medical history.

Given that MCS is a diagnosis of exclusion, physicians must be familiar with and rule out relevant differential diagnoses.

As MCS patients attribute their symptoms to a number of different environmental factors, they consequently also present to a number of different medical specialties, including dermatologists as well as environmental medicine, social and occupational medicine, psychosomatic medicine, and ENT specialists. Depending on the individual complaints, other specialists too may be consulted. Dermatologists should be familiar with MCS and should be able to diagnose cutaneous symptoms independently of this condition. Given that MCS is a diagnosis of exclusion, physicians must be familiar with and rule out relevant differential diagnoses. As it will be necessary to consult with other specialists, patients should be asked to release other physicians involved in their treatment from confidentiality [27]. Referrals to other specialists should always be discussed with the patients [27]. This course of action requires empathy and also time, which may be limited in everyday clinical practice for economic reasons [28].

Physicians should ask their patients about previous diagnostic tests and treatments [25]. If patients provide prior test results, physicians should use layman's terms to expressly emphasize that these results are normal (if applicable) [27].

In order to be able to treat diseases that are associated with similar symptoms and comorbidities, it is useful to run some basic laboratory tests. Moreover, thyroid disorders as well as type I and type IV hypersensitivities should be ruled as possible causes. The choice of allergy tests should always be guided by the patient's medical history and symptoms in connection with specific or otherwise relevant environmental factors. Nonspecific and expensive screening tests should be avoided [29, 30]. While we frequently see MCS patients in our outpatient clinic who have undergone extensive diagnostic testing, these tests often lack any scientific or clinical evidence, let alone clinical/therapeutic consequences.

If there is any indication as to other specific environmental disease causes, e.g., due to toxic metals (cadmium, mercury), they must be ruled out by appropriate diagnostic tests. Biological monitoring requires a medical justification (i.e., clinical symptoms or definitive exposure). If this is the case, patients should be referred to an environmental medicine specialist for urinalysis to measure levels of organic compounds such as polychlorinated biphenyls, halogenated hydrocarbons (e.g., hexachlorobenzene, ppDDE), naphthol or hydroxypyrene (air pollution). It is important to note that the levels thus determined are reference values and not toxicological threshold values. For purely statistical reasons, the values will be outside the reference range in some cases. This needs to be explained very clearly, otherwise MCS patients will tend to attribute their symptoms to that particular environmental agent [31]. However, this is scientifically not justified.

When taking a patient's biopsychosocial history, it is essential to inquire about aspects such as subjective theories regarding the disorder as well as health and disease behavior. Whenever there are signs of psychosocial stress, the questions should also address issues such as family and social environment, situation at the workplace, traumatic events and resources [25].

In cases of suspected mental comorbidity as well as psychosocial impact or sequelae caused by the disorder, patients should be referred to an appropriate specialist. In order to counteract any stigmatizing attitudes towards psychosomatic medicine, it is important to explain to patients that mental and physical processes in the body develop in parallel and that the distinction between the various medical specialties is more a question of language than of science [16]. Supportive psychotherapeutic care is useful, especially given the difficult psychosocial situation affected individuals find themselves in.

Counseling by social medicine or occupational medicine specialists is crucial, especially in cases where patients can no longer work or otherwise participate in

social activities due to their condition. Pursuant to the German Social Code (Sozialgesetzbuch), patients may have their disease recognized as disability (due to the high level of impairment) (Article 2 SGB Volume IX) and claim social security benefits (Article 4 SGB Volume IX).

If there is evidence of olfactory or respiratory problems, patients should be referred to an ENT specialist.

Procedures other than those mentioned above are usually not useful or not feasible in the diagnostic workup of patients with MCS. For example, while evaluation of the patient's sense of smell and olfactory threshold might actually be useful, affected individuals will frequently decline such a test due to the various fragrances (triggers) contained in the test kit. Moreover, as there is conflicting data regarding this test, it is not considered an evidence-based diagnostic procedure [32]. Although provocation studies have shown biosensory measurements to be useful in the diagnosis of MCS, they are too complex for everyday practice [12]. Questionnaire-based methods such as the chemical odor sensitivity scale [33] can help identify individuals with increased susceptibility to MCS but are not suitable for making a definitive diagnosis. There is as yet no biomarker for MCS [34].

Especially for environment-related symptoms, patients frequently urge physicians to perform further diagnostic tests, many of which are not evidence based. As the goal of quaternary prevention is to avoid unnecessary interventions, patients must be protected from excessive medical procedures based on the tenet "first, do no harm" (*primum non nocere*). This helps avoid unnecessary diagnostic tests, misdiagnoses, excessive treatments as well as mental, social and financial strain on the part of affected patients [35]. The diagnostic workup and (making the) actual diagnosis always require caution and an interdisciplinary approach to rule out other possible disease causes, as this will have real-life consequences for the subsequent treatment.

MCS patients must be protected from unnecessary diagnostic tests, misdiagnoses and excessive treatments.

The diagnosis of MCS can only be made following interdisciplinary assessment of the individual case, a consensus-based diagnostic workup and exclusion of other causes for the symptoms. There is some controversy as to whether the correct ICD-10 code for MCS should be T78.4 ("allergy, unspecified") or rather code F45.0 ("somatization disorder"). While the DIMDI institute (German Institute for Medical Documentation and Information) codes MCS using code T78.4 in its list of diagnoses [36], MCS is also mentioned in the S3 guidelines "Management of patients with nonspecific, functional and somatoform physical symptoms" [27].

To date, there are no evidence-based treatment recommendations

To date, there are no evidence-based treatment recommendations for MCS. Cutaneous symptoms such as pruritus may be addressed with symptomatic treatment using basic skin care products. Patients should be expressly advised that their symptoms will likely improve but that there is no cause for worry if there is no immediate relief [27]. It has proven useful to schedule patients for a follow-up appointment two to four weeks later in order to monitor the disease course and adjust the treatment approach, if necessary [27]. Besides the treatment of cutaneous symptoms and other comorbidities, close cooperation with environmental medicine and other specialists should be sought.

Treatment decisions are primarily guided by the severity of the clinical presentation and any prognostic factors regarding the future disease course (Table 2). For patients with severe clinical symptoms or unfavorable prognostic

Table 2 Tool for assessing disease severity and making treatment decisions (modified after [25, 45]).

Characteristics of mild disease and possible favorable factors	Clinical characteristics of severe disease	Warning signs for preventable harmful progression (red flags)
<ul style="list-style-type: none"> – Few, short-lived symptoms – Subjective well-being is largely consistent with objective findings – No or only mild psychosocial burden – Active coping strategies – Healthy lifestyle – Social support – Favorable conditions at the workplace – Successful doctor-patient relationship – Bio-psycho-eco-social approach, avoiding disaster scenarios and unnecessary measures 	<ul style="list-style-type: none"> – Multiple different symptoms – Frequent or persistent symptoms – Dysfunctional perception of health/disease and dysfunctional behavior – Significantly reduced functioning (sick leave > 4 weeks, social withdrawal, physical deconditioning) – Moderate-to-severe psychosocial stress – Mental comorbidity – Difficult doctor-patient relationship 	<ul style="list-style-type: none"> – Very severe symptoms – Self-injury – Suicidal tendencies – Physical sequelae – Severe mental comorbidity with significant impairments in everyday life – Frequent changes of health care professionals and frequent treatment discontinuations – Evidence of iatrogenic harmful behavior
→ Continue treatment; offer psychosocial care, if necessary; repeat assessment after three months	→ Interdisciplinary care by specialist/s and psychotherapist	→ Immediate initiation of interventions, for example, in a (semi-)inpatient setting at an appropriate facility

factors, treatment in a (semi-)inpatient setting at an appropriate facility should be considered.

Treatment should primarily focus on coping strategies.

As most patients perceive avoidance as a particularly useful strategy, this is frequently the intervention of first choice [37]. In many cases, however, avoiding (the) trigger(s) completely is either impossible or results in significant impairment of quality of life. Moreover, as long as there is no scientific evidence that avoidance is effective, treatment of MCS should primarily focus on coping strategies in order to prevent reinforcement of anxiety [26].

Based on patient reports, relaxation techniques, patient support groups, air filters and dietary changes have a positive effect on MCS symptoms.

Given our requirements in terms of hygiene and technical standards, achieving an entirely “MCS-friendly” environment seems to be next to impossible. Reference values can only be lowered so much, and this approach reaches its limits when it comes to essential foods and other substances (e.g. cleansing and disinfection agents) [38]. At this point, at the latest, patients must use individual measures to protect themselves [38].

In a survey, many affected individuals reported that meditation or prayer had a positive effect on their symptoms [39]. Dietary changes (rotation diet or dietary supplements such as *lactobacillus acidophilus* or magnesium), air filters, massages, acupressure, patient support groups and other measures were considered useful by many MCS patients [39]. On the other hand, based on patient reports, pharmacological treatment had a negative effect on their symptoms [37].

Considering the multitude of hypotheses on the pathogenesis of MCS and the large number of organ systems potentially affected, there are many symptomatic treatment strategies apart from mere avoidance of possible triggers. All of these strategies should be based on an interdisciplinary approach.

Supportive psychosomatic or psychotherapeutic measures, learning relaxation and stress management techniques (e.g. “mindfulness-based stress reduction” [40]), and increased physical activity can all improve coping in everyday life and lead to enhanced well-being [25].

Some authors recommend various combinations of different antioxidants, frequently accompanied by “detoxifying” measures [41]. However, these measures are not evidence based. Not least because of the varying doses and combinations used, it is difficult to evaluate the benefits of individual substances. Treatment with a multitude of pills and infusions may lead to “catastrophizing”, thus making patients perceive their disorder particularly negatively; this phenomenon is known to have a negative impact on the subsequent disease course. One should also keep in mind that such treatments place a significant financial strain on patients.

It has been demonstrated that nasal sprays with hyaluronic acid used to treat olfactory symptoms can improve the well-being of affected study subjects [42]. Transcranial magnetic stimulation has also been shown to improve the symptom burden, while having no effects on functional impairment [43].

Scientific studies have shown that psychotherapeutic support, nasal sprays with hyaluronic acid and transcranial magnetic stimulation may improve the well-being of patients with MCS.

If MCS is regarded as a somatoform or functional disorder, it may be treated accordingly [44]. For treatment of functional physical symptoms, physicians from all medical specialties are recommended to observe the S3 guidelines “Management of Patients with Nonspecific, Functional and Somatoform Physical Symptoms” [27].

If patients demand additional treatments that are not evidence based and may do more harm than good, readily understandable language should be used to explain to them why these interventions will not have the desired effects.

Medical skills beyond diagnosis and treatment: listening and taking symptoms seriously

Irrespective of the various – and anything but clear-cut – options for diagnosis and treatment, caring for MCS patients requires that physicians have certain ‘soft skills’. In particular, patients with a condition that has no known cause and no definitive diagnostic and therapeutic options are greatly affected by this uncertainty and are therefore susceptible to mental sequelae. It is the responsibility of physicians of all specialties to take these patients seriously, build a trusting doctor-patient relationship and to relieve them of the fear of harmful developments, without belittling or negating their symptoms [27]. It is important that physicians listen to their patients carefully and attentively, without interrupting them during the first phase of the interview [27]. The physician’s communicative and psychosocial skills are therefore particularly important; additional psychotherapeutic expertise is likewise useful (Table 3).

When talking to affected individuals, physicians should exhibit an actively supportive attitude and use language that is readily understood by lay persons.

When talking to affected individuals, physicians should exhibit an actively supportive attitude and use language that is readily understood by lay persons. If necessary, one should actively ensure that the patient has understood the information given. Stigmatizing or catastrophizing communication must be avoided in

Table 3 Medical skills according to Egger (2017) [16].

Mandatory communication (psychosocial) skills	Mandatory skills in natural science	Special skills in psychotherapy
Professional doctor-patient communication; promoting a bio-psycho-eco-social understanding of the condition	Knowledge of and skills in bio-medical interventions and surgical options	Knowledge of and psychological skills in the management of behavioral risk factors; actively and supportively helping patients to help themselves; resource orientation

order to build a positive doctor-patient relationship [45]. If the medical history and clinical findings do not yield any evidence for a preventable and potentially harmful progression of known physical or mental diseases, this should be immediately communicated and explained to the patient, using clear and readily understandable language [27]. Patients should be involved in setting incremental, realistic treatment goal such as improved well-being, or increased physical or social activity [27].

Advanced medical education courses available to dermatologists in this context include courses on “basic psychosomatic care”. Communication training is another option to improve their skills in effectively communicating with and managing MCS patients.

Conclusions

Patients with MCS respond to even very small levels of environmental agents and present with a wide range of nonspecific symptoms. As the skin may also be affected, for example, in the form of pruritus, dermatologists will be confronted with this disorder in everyday clinical practice.

Establishing a definitive classification of MCS remains a challenge due to our insufficient understanding of its pathogenesis and particularly due to the lack of objective, evidence-based biomarkers. Thus, MCS is a diagnosis of exclusion. It is up to the dermatologist to investigate and, if needed, treat any skin diseases and hypersensitivities that may be the cause of the patient's symptoms. To date, there is no evidence-based treatment for MCS.

Exactly for this reason, interdisciplinary cooperation in both diagnosis and treatment is just as important for MCS patients as treating any cutaneous symptoms, for example, by using basic skin care products. Communication skills on the part of physicians are essential, and patients' symptoms have to be taken seriously.

Science needs to comply with the demands of those affected and investigate the effects of anthropogenic agents on the human body in greater detail. In the course of these investigations, scientists also need to clarify whether MCS is primarily a psychosomatic, a somato-psychological, or a “circular” disorder. In the future, this may offer new options for diagnosis and treatment of MCS.

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Correspondence to

Claudia Traidl-Hoffmann, MD, PhD
Institute of Environmental
Medicine
UNIKA-T
Neusäßler Straße 47
86156 Augsburg, Germany
E-mail: claudia.traidl-hoffmann@
tum.de

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Lernerfolgskontrolle

1. Mögliche protektive Faktoren, die gegen einen schweren Krankheitsverlauf sprechen sind:

1. aktive Bewältigungsstrategien (zum Beispiel körperliches Training, positive Lebenseinstellung, Motivation für Psychotherapie)
 2. deutlich reduzierte Funktionsfähigkeit; Arbeitsunfähigkeit > 4 Wochen, sozialer Rückzug
 3. gelingende Behandler-Patient-Beziehung
 4. biopsychosozialer, entkatastrophisierender Ansatz unter Vermeidung unnötiger Maßnahmen
 5. dysfunktionale Gesundheits-/ Krankheitswahrnehmung
- a) Alle sind richtig.
 - b) Es gibt keine protektiven Faktoren.
 - c) Schwere Krankheitsverläufe sind immer zu erwarten, da es sich um eine chronische Krankheit handelt.
 - d) 1, 3, 5 sind richtig.
 - e) 1, 3, 4 sind richtig.

2. Welche Aussage zur MCS-Symptomatik ist richtig? Symptom/e der MCS ist/sind ...

- a) Symptome eines Organsystems.
- b) eine mehrtägige Verzögerung der Symptomatik nach geringer Exposition.
- c) eine positive Familienanamnese zu Anosmie.
- d) unspezifische Beschwerden bei Kontakt gegenüber verschiedenen Stoffen aus der Umwelt.
- e) eine Kontaktallergie zu einem Metall.

3. Welche Aussage zur Diagnostik von MCS ist richtig?

- a) MCS-Diagnostik sollte nur bei drohender Berufsunfähigkeit erfolgen.
- b) Nach einer gründlichen biopsychosozialen Anamnese kann in den meisten Fällen auf eine somatische Diagnostik verzichtet werden.

- c) Fremdanamnesen sind bei MCS schwerer zu gewichten als Eigenanamnesen.
- d) Die umfassende Umweltanalytik im Urin ist der Goldstandard in der Diagnosefindung.
- e) Die MCS-Diagnose ist eine Ausschlussdiagnose, für die es keine validierten Biomarker gibt.

4. Welche Aussage zu MCS ist richtig?

- a) Die Therapie der MCS-Symptomatik erfolgt ausschließlich durch die Dermatologie.
- b) Zur Behandlung von MCS sind vor allem chirurgische Kompetenzen notwendig.
- c) Eine aktiv unterstützende Grundhaltung hilft dabei, eine vertrauensvolle Beziehung mit MCS-Patient*innen oder Menschen mit MCS aufzubauen.
- d) Anstatt kleinschrittige Ziele zu vereinbaren, sollte immer die vollständige Heilung von MCS im Vordergrund stehen.
- e) MCS ist eine Modekrankheit und muss deshalb nicht ernst genommen werden.

5. Welche Aussage zur Therapie von MCS ist richtig?

- a) Pharmakologische Therapie hat sich zur Behandlung der MCS als wirksam erwiesen.
- b) Die Therapie von MCS gestaltet sich für jeden Fall gleich.
- c) Betroffene fordern häufig psychotherapeutische Begleitung, obwohl diese nicht evidenzbasiert ist.
- d) Diagnosestellung und Therapie sollten erst nach interdisziplinärer Absprache erfolgen.
- e) Eine Vermeidungsstrategie wird als erste Therapieoption empfohlen.

6. Welche Aussage zu MCS ist richtig?

- a) MCS ist keine Behinderung nach dem SGB IX.
- b) Rehabilitationsmaßnahmen können von den Krankenkassen übernommen werden.
- c) Eine sozialmedizinische Einbindung ist nur bei zusätzlicher Komorbidität sinnvoll.
- d) Eine (teil-)stationäre Behandlung ist bei einer chronischen Erkrankung wie der MCS nicht indiziert.
- e) Eine chemikalienarme Umgebung ist ungünstig, da wiederholte Provokation die Reizschwelle erhöht.

7. Welche Aussage zu MCS-Patienten ist falsch?

- a) Die geschätzte Prävalenz von diagnostizierten MCS-Fällen in Deutschland beträgt circa 0,5 %.
- b) Eine MCS kann auch bei Betroffenen ohne Kenntnis über die initial auslösende Exposition diagnostiziert werden.
- c) Fragebögen sind nicht zur Diagnostik von MCS geeignet.
- d) MCS-Patient*innen haben selten Kontakt zu multiplen Ärzt*innen, sondern gehen direkt in entsprechende Umweltambulanzen.
- e) MCS-Patient*innen präsentieren sich häufig mit polymorpher Symptomatik.

8. Welche Aussage ist zu MCS ist falsch?

- a) MCS ist eine Berufserkrankung.
- b) Es wird kontrovers diskutiert, ob MCS nach ICD-10 als T78.4 oder F45.0 zu kodieren ist.
- c) MCS wird von den gesetzlichen Krankenkassen anerkannt.
- d) MCS steht für multiple Chemikaliensensibilität und wird mit „idiopathischer Umwelttoleranz“ beziehungsweise *Idiopathic Environmental Illness (IEI)* synonym verwendet.

- e) MCS führt in schweren Fällen zur sozialen Isolation durch Unverständnis im Umfeld und zu Vermeidungsverhalten aus Angst vor Triggerexposition.

9. Welche Aussage zu MCS ist falsch?

- a) Bei Herz-Kreislauf-Symptomatik ist eine kardiologisch-internistische Abklärung ratsam.
- b) Bei dermatologischen Beschwerden, die der Patient mit einer Umweltexposition in Zusammenhang bringt, ist eine rasche Überweisung an die Psychosomatik ratsam.
- c) Ein Patchtest ist bei Hinweisen auf eine Sensibilisierung durch Metalle ein valides Diagnosemittel.
- d) Dermatologische Beschwerden bei MCS treten häufig in Form trockener

Haut, Rubeosis faciei und Pruritus auf.

- e) Missempfindungen, vor allem des Geruchs- und Geschmackssinns, können Symptome einer MCS sein.

10. Welche Aussage zur Pathophysiologie ist falsch?

- a) MCS könnte durch eine klassische Konditionierung auf olfaktorische Reize entstehen.
- b) In allen Studien kristallisiert sich eine niedrigere Geruchsschwelle und eine höhere Diskriminationsfähigkeit zwischen Duftstoffen der MCS-Patient*innen heraus.
- c) Eine Hypothese zur Pathogenese von MCS ist der toxisch bedingte Toleranzverlust.
- d) Zu den auslösenden Umweltstoffen zählen unter anderem Schwer-

metalle, Desinfektionsmittel und Duftstoffe.

- e) MCS kann nach kurzzeitiger Exposition einer hohen Dosis und nach langzeitiger Exposition einer niedrigen Dosis eines auslösenden Umweltstoffs entstehen.

Liebe Leserinnen und Leser,
der Einsendeschluss an die DDA für diese Ausgabe ist der 13. März 2020.
Die richtige Lösung zum Thema „Eosinophile Hautkrankheiten“ in Heft 10 (Oktober 2019) ist: (1e, 2c, 3b, 4c, 5c, 6b, 7e, 8c, 9e, 10c).

Bitte verwenden Sie für Ihre Einsendung das aktuelle Formblatt auf der folgenden Seite oder aber geben Sie Ihre Lösung online unter <http://jddg.akademie-dda.de> ein.