

'Malregulative' Rather Than 'Functional' Dysphonia: A New Etiological Terminology Framework for Phonation Disorders—A Position Paper by the Union of European Phoniaticians (UEP)

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Summary: Practitioners in the field of voice are often faced with patients who are 'dysphonic', but who do not have identifiable abnormalities of the vocal tract structures or any neural or hormonal alteration affecting the phonatory function. For lack of better nomenclature describing the origin of the disorder, this group of patients has been labeled as having 'non-organic' or 'functional' dysphonia. 'Non-organic' only states what the dysphonia is not, and 'functional' does not have any etiological implication. Hence 'functional disorder' as a determination of the origin is at best vague, imprecise and often misleading. In truth, the terms "functional" and 'non-organic' are by now so muddled and confused in everyday clinical usage and parlance that it is unclear what they mean in any given clinical setting or for any particular clinical case. Thus, the UEP Voice Committee (VC) has come to the conclusion that it is best to adopt a new term that is clearly defined, universally agreed to, and indicative of a different and more useful perspective. We have reviewed the literature relating to terminology of these phonatory disorders. We now propose replacement of the phrase 'functional dysphonia' with 'malregulative dysphonia', since the indication of faulty regulation represents an etiological connotation. We also propose a restructuring of the etiological terminology of phonation disorders. We believe this to be a biologically clearer framework for the labeling of 'non-organic' phonatory disorders, and hope that its routine use will allow for more clarity of presentation and discussion in the future.

Key Words: Etiology—Functional dysphonia—Malregulative dysphonia—Phonation disorders—Voice disorders.

INTRODUCTION

Vocal disorders are usually classified into those with observable underlying structural changes in the vocal tract (e.g., polyp), including those which are caused by neurogenic (e.g., Parkinson's disease) and hormonal alterations (e.g., acromegaly) and those without such observable changes (non-organic disorders).

The latter, the so-called 'non-organic' vocal disorders in which there is a backdrop of psychosocial or behavioral causes are frequently described under the rubric of 'functional dysphonia'. However, this term has become so muddled and confused in everyday clinical usage and parlance that it is unclear what it means in any given clinical setting or for any particular clinical case. It must often be paraphrased due to its vagueness and it has also been criticized as imprecise because its etiological sense does not imply causation.

'Non-organic' as a collective term implies that the traditional term 'organic voice disorder' not only encompasses

diseases of the vocal tract, but also the vocal consequences of nervous or hormonal regulation deficits (Table 1).

Voice symptoms relating to a vocal fold lesion (vocal tract alteration) or to vocal fold hypokinesis due to Parkinson's disease (neurogenic alteration) are each referred to as arising from an 'organic voice disorder'. To extend the term 'organic' to structural deficits related to organs of the neural and hormonal systems, does not seem to be didactically favorable: A structure of the brain is not a part of the vocal organ, rather it belongs to the control system of the vocal tract.

This position paper renames the terms 'non-organic' and 'functional' dysphonia as 'malregulative' dysphonia and at the same time proposes a restructuring of the etiological classification of phonation disorders to better identify where this term fits in.

BACKGROUND AND LITERATURE REVIEW: RATIONALE FOR A DIFFERENT TERMINOLOGY

Several scientific papers point out the ambiguous nature of the term 'functional'.^{1,3,8-11} On the one hand from an etiological point of view the term is indicative of a disorder of *nervous regulation*^{2,4,5-7,12,14-16}; on the other hand, the term is often used inappropriately with the conveyed meaning being one of dysfunction, a symptom of the complex disorder 'dysphonia'.^{8,9,12,14}

Habermann (1980)¹ reviewed 'functional' voice disorders (up to 1980), and stated that phoniatics had not yet found a definite and fully satisfactory definition for 'what is

Accepted for publication April 21, 2020.

Conflict of interest: No funding or conflicts of interest.

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Journal of Voice, Vol. ■■■, No. ■■■, pp. ■■■–■■■
0892-1997

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<https://doi.org/10.1016/j.jvoice.2020.04.032>

TABLE 1.
Traditional Terminology of Voice Disorders - rejected by the authors

| Etiology of dysphonia (traditional terminology) | | |
|---|---|---------------------------------------|
| Organic dysphonia | Non-organic, functional dysphonia | Combined organic-functional dysphonia |
| Vocal tract alterations Neurogenic alterations Hormonal alterations | Psychogenic dysphonia, Habitual dysphonia, Muscle tension dysphonia, Hyperfunction, Vocal load dysphonia etc. | |

Alterations of the vocal tract, as well as diseases of the nervous system and the hormonal system that lead to voice changes, are referred to as organic dysphonia. The voice disorders that are not classified here are called 'non-organic' or 'functional'.

functional' in the course of disease. He followed the history of conceptual development of 'functional' back to the early twentieth century, citing authors such as Imhofer (1913), Nadoleczny (1926) and Flatau (1929), who used the term 'phonasthenia', whereas, Tarneaud (1932)² replaced it with the term 'dyskinesia'. Tarneaud (1932) postulated that 'dyskinesia' is a muscle-tone disorder that is explained by the disruption of the match of voluntary and automatic nerve impulses.

Of note, the term 'functional' was already in use in early years by phoniatic professionals as a 'diagnosis of exclusion'. For example, according to Weiss (1934),³ the attribute 'functional' is transient, and is valid only as long as the methods of medical examination are not able to find the organic causes of the pathological state.

Barth (1911)⁴ and Stern (1924),⁵ spoke of functional disturbances in cases 'when the diagnostic resources available to us are unable to detect any organic alteration, i.e. the vocal organ is healthy, at the same time the temporal and dynamic order of the decisive factors of phonation in their interaction, in a sense their 'staging,' are disturbed'. These comments from the beginning of the twentieth century fit nicely with the idea, supported by the VC of a 'regulatory' disorder.

Tarneaud in 1938 (cited by Schultz-Coulon (1980)⁶) also appeared to support this concept. He felt that functional voice disorder is a 'coordinative dysregulation of the phonatory organs'. Hartlieb (1969)⁷ compares the functional disorder to a 'biocybernetic' process, while pointing out the sources of errors in regulation and feedback. Schulz-Coulon (1980)⁶ shared this view: in functional voice disorder, he said, there is a '... disturbed or faulty drive and regulation of central nervous phonation control'.

Thus again and again the idea of aberrant regulation, or 'malregulation' was touched upon by many of our Phoniatic forebears.

More recent literature continues to criticize the term 'functional' as ambiguous and therefore misleading: for example, Pahn (1988)⁸ who also criticized the term 'non-organic' in the following manner: 'With this negative statement, the etiological possibilities are indeed restricted, but not sufficiently differentiated'.

Morrison and Rammage (1993)⁹ used the term 'functional' as a *symptom* interpretation, noting, however: 'This use of the word 'functional' is, however, intrinsically

ambiguous, and so we propose an alternative term based on descriptive features of dysfunction: 'muscle misuse voice disorders'.

Verdolini et al (2006)¹⁰ in their classification of voice disorders put the term 'functional' voice disorder in quotation marks, and describe it as a subject of controversy, noting: 'The terms of functional voice disorders and muscle tension dysphonia have often been understood as diagnoses of exclusion'.

The VC agrees broadly with these perspectives.

Roy (2003)¹¹ characterized functional dysphonia as '...an enigmatic and controversial voice disorder...' Of note, he looks back to colleagues from yesteryear, by claiming the proximal cause of functional dysphonia to be that of 'poorly regulated activity of the intrinsic and extrinsic laryngeal muscles'. He thereby brings us back to the idea of a 'malregulation', contending that 'this conflict between laryngeal inhibition and activation (that has its origin in personality and nervous system functioning) results in elevated laryngeal tension states and can give rise to incomplete or disordered vocalization in structurally and neurologically intact larynx'.

Rammage et al (1987)¹² also emphasize the symptoms of tension in functional dysphonia (e.g., vocal hyperfunction and muscular tension dysphonia), as arising from overactivity of the autonomic and voluntary nervous system in individuals who are unduly aroused and anxious. The authors included the 'symbolic' symptom among the forms of psycho-pathogenesis of vocal disorders 'which occur on the basis of an unconscious substitution of a somatic symptom involving the sensory or voluntary motor nervous system for a psychological conflict'. The VC feels that this fits well into the paradigm of 'malregulation' that we are espousing. We also feel that it is a useful construct if working from a therapy-centered etiological system like that outlined by Mathieson (2001)¹³ who juxtaposed the category 'organic' with the term 'behavioral' rather than with the label 'functional'.

BASIC CONSIDERATIONS AND A NEW DEFINITION

As noted above, many of our colleagues have struggled semantically with the ambiguity of the diagnosis 'functional dysphonia' and have found that this lack of precision has led to difficulty in communication. Recently Hacki et al¹⁴

TABLE 2.
Etiological Classification of Dysphonia, Following the Principle of 'Alteration to the Vocal Structures and/or Their Disrupted Regulation'

| Etiology of dysphonia | | |
|--------------------------------|--|--|
| Structural (organic) dysphonia | Regulative dysphonia | Combined structural-regulative dysphonia |
| | Hormonal dysphonia Neurogenic dysphonia: central, peripheral Malregulative dysphonia: psychogenic behavioral, sensory | |

All regulatory disorders are classified under 'regulative dysphonia', including the 'malregulative' ones, which are usually referred to as 'functional'.

have recommended a newer taxonomy for dysphonia, on the basis of structural and regulatory integrity of the vocal structures. Within this taxonomy they have suggested the idea of a 'regulatory dysphonia' and in particular, the possibility of a 'malregulation'. We (the VC) support this, and feel that it is consistent with the constructs of many of our Phoniatic forbears. In particular:

A preliminary remark on the terminology: voice versus phonation

The VC employs the term 'phonation disorder' (rather than 'voice disorder') as a synonym for dysphonia on the basis that *voice* is only the end-product of the complex communicative function *phonation*. We are of the opinion that an alteration of a person's voice is perhaps the most striking, but not always the most important, symptom of dysphonia (e.g., impairment of vocal loading capability, severe discomfort, speech anxiety, etc.).

Structure and regulation

Biologically, all social and environmental influences have their effect via organs/structures or their regulatory mechanisms. In other words: 'the complex functionality of our organism depends on the organs/structures and their regulation' (Hacki et al¹⁴). Reviewed in this light, phonation is based upon the vocal structures (collectively, the vocal tract: trachea, larynx, pharynx, oral and nasal cavity) together with the underlying neural and hormonal regulatory mechanisms. As such, a disorder of phonation can only be based on structural or regulatory components (Table 2). Structural (organic) dysphonia occurs in association with structural alteration of the vocal tract. (It should be emphasized that we limit the term structural-organic to the vocal tract.) The etiology of non-structural (non-organic) disorders, then, can only lie within the regulatory components. Therefore, non-structural dysphonia can and, we think, should be labeled as 'regulative dysphonia'.

The major regulatory components fall under hormonal and neural control. Hormonal disorders can result in or underlie hormonally regulative dysphonia (e.g., mutational voice disorder). Neural disorders due to structural changes in the central and/or peripheral nervous system (e.g., stroke,

trauma, paralysis, etc.) can result in or underlie neurogenic regulative dysphonia. Some of these voice disorders may be permanent. Some, however may be temporary, inconsistent or even inconsequential, in essence a faulty regulation, i.e., a 'malregulation'.¹ The VC therefore recommends that dysphonia of this nature be defined as 'malregulative dysphonia' rather than 'functional dysphonia'.

Malregulation

'Malregulation' typically concerns the psychomotor and the sensorimotor control systems.

Causes of malregulative dysphonia typically include psychogenic, behavioral and sensory etiologies. The often-capricious character of these types of dysphonia is well known. Aphonia, which occurs suddenly and sometimes disappears spontaneously, variable symptoms of respiration, voice overload, voice misuse and muscle tension disorders in their often-altering forms are some manifestations of behavioral malregulation.

A disturbance in the auditory and/ or somatosensory feedback mechanisms can also lead to malregulation. Examples of sensory malregulation might include phonatory problems such as a consequence of hearing impairment (temporary or permanent), short-term hoarseness after drinking cold water, etc. Hoarseness after 'healed' upper respiratory symptoms may point to an origin in the disturbed somatosensory feedback: 'learned adaptations after upper respiratory tract infection' as interpreted by Roy (2003)¹¹; or Multinovic's 'registered phonoponoses'², subsequent to healed inflammatory changes (Milutinovic 1991).¹⁵ Similarly, 'the sensorimotor mechanism' implicit in the therapeutic success of topical lidocaine on the laryngeal mucosa in muscle tension dysphonia is a subject of consideration (Dworkin et al 2000).¹⁶

It has been deemed advisable to create the new category of 'combined structural-regulative dysphonia' for cases in

¹From other possible terms, such as dysregulation, misregulation, pararegulation, we have chosen the encoding 'malregulation, malregulative', according to similar applications in medicine.

²Vocal technique-related dysphonia—term of the spanish phoniatician J. Perello, 1962.

which structural changes are accompanied by regulatory etiologies (e.g., hormonal-induced phonatory disorders such as acromegaly, psychosomatic dysphonias such as some cases of contact granuloma). Rammage et al (1987)¹² for one, list among the pathogenesis of phonation disorders, ‘combined organic and psychogenic processes’. Here, as in reflux laryngitis, often a complex mixture of organic, psychological and social factors play a role (Rammage 1987).

CONCLUSION

The term ‘non-organic dysphonia’ has been used for many years, but it only says what the dysphonia is not. Furthermore, what it is, is incorrectly characterized by the imprecise term ‘functional dysphonia’. The term ‘functional’ is by now so muddled and confused in everyday clinical usage that it is unclear what it means in any given clinical setting or for any particular clinical case. Thus, it is best to adopt a new term that is clearly defined, universally agreed to, and indicative of a different and more useful perspective. From an etiological aspect, the VC now proposes replacement of the term ‘functional dysphonia’ with the term ‘malregulative dysphonia’. It seems to us more reasonable to explain to our partners that, e.g., muscular imbalance (‘hyperfunction’), a breathing dyscoordination or a sudden dysphonia/aphonia, which are frequently temporary and alternating, are caused by derailed regulatory mechanisms of our nervous system (malregulative psychomotor and sensorimotor mechanisms) than to talk about ‘functional’ events.

We believe that the categories ‘structural’ and ‘regulative’ also the sub-categories ‘hormonal’, ‘neural’ and ‘malregulative’ provide a biologically clearer framework for the labeling of phonatory disorders. Of course, adequately placing a disorder within this framework can and should be subject to further clinical-scientific discussions, possibly in the form of expert clinician-driven surveys.

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