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A Comprehensive Assessment of The Eight Vital Signs

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Abstract

The term "vital sign" has been assigned to various phenomena with the presumptive intent to emphasize their importance in health care resulting in the emergence of eight vital signs with multiple designations and overlapping terms. This review developed a case definition for vital signs and identified and described the fifth through eighth vital signs. PubMed/Medline, Google and biographical databases were searched using the individual Medical Subject Headings (MeSH) terms, vital sign and fifth, vital sign and sixth, vital sign and seventh, and vital sign eighth. The search was limited to human clinical studies written in English literature from 1957 up until November 30, 2021. Excluded were articles containing the term vital sign if used alone without the qualifier fifth, sixth, seventh, or eighth or about temperature, blood pressure, pulse, and respiratory rate. One hundred ninety-six articles (122 for the fifth vital sign, 71 for the sixth vital sign, two for the seventh vital sign, and one for the eighth vital sign) constituted the final dataset. The vital signs consisted of 35 terms, classified into 17 categories compromising 186 unique papers for each primary authored article with redundant numbered vital signs for glucose, weight, body mass index, and medication compliance. Eleven terms have been named the fifth vital sign, 25 the sixth vital sign, three the seventh, and one as the eighth vital sign. There are four time-honored vital signs based on the case definition, and they represent an objective bedside measurement obtained noninvasively that is essential for life. Based on this case definition, pulse oximetry qualifies as the fifth while end-tidal CO_2 and cardiac output as the sixth. Thus, these terms have been misappropriated 31 times. Although important to emphasize in patient care, the remainder are not vital signs and should not be construed in this manner.

Keywords: pain, pulse oximetry, physical examination, vital signs, measurements

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Introduction

The term "vital signs" in a modern sense first appeared in the medical literature in 1866 in a paper written by Edward Constant Séguin (1843–1898) titled "The use of the thermometer in clinical medicine" when visually graphing the course of pneumonia. According to Séguin, "The cases are accompanied by a diagram, fac simile of the tables of 'Vital Signs' used at the bedside to make the daily record of temperature, pulse-beats and respiration (p.193)" (1). It was Harvey Cushing (1869–1939) who, in 1903, recommended the inclusion of blood pressure along with the other three vital signs (temperature, pulse, and respiratory rate) already routinely used in hospital practice (2). Since that time, a variety of terms, including settings, states, conditions, measurements, diseases/diagnoses, symptoms, psychosocial issues, and physical activity/functional status/performance, have been designated as "vital signs" as a way to bring their significance to the attention of physicians and other health care providers.

The words "sign" and "vital" are first defined to develop a proposed working case definition of a "vital sign". Signs are elicited by the patient or physician through inspection, palpation, percussion, and auscultation and may also be unmasked by applying a variety of different maneuvers. They provide objective information about the patient and assist in diagnosis when combined with subjective and objective symptoms (3). Physical, radiolog-

ic, laboratory, and pathologic abnormalities identified during patient assessment like signs, represent a departure from the normal state. The important point about signs, which distinguishes them from objective symptoms or physical findings, is that they represent attributions, inferences, or interpretations as an aid in identifying and diagnosing disease (3,4). In other words, they provide the evaluator with meaning or explanation for an observation or finding. Based on these attributions, the time-honored named "vital signs" fall short of meeting the case definition of a "sign" because they only represent quantitative measurements with values falling outside the normal range referred to by the following low and high-value terms: temperature (hypothermia and hyperthermia), pulse (bradycardia and tachycardia), blood pressure (hypotension and hypertension), and respiratory rate (bradypnea and tachypnea) (3). These terms represent physical findings, not signs, and thus the latter is a misnomer (3). Despite this, the term "vital signs" is firmly ingrained within the medical terminology, and it is unlikely that it will change to an alternative one such as vital functions, vital findings, or vital measurements (3).

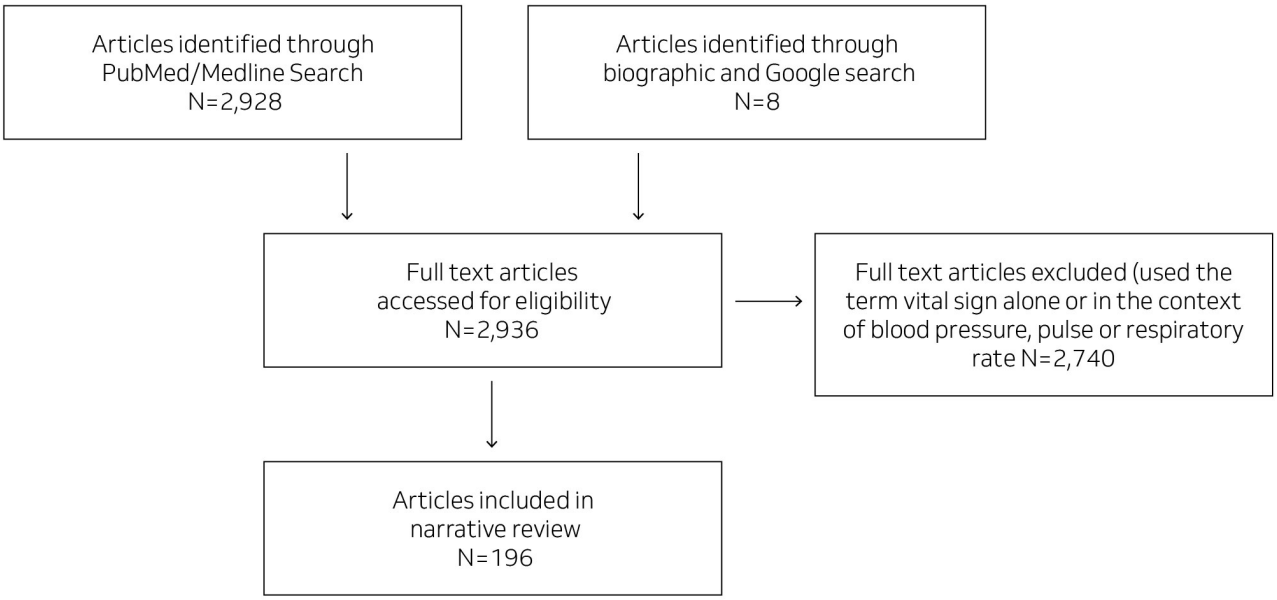


Figure 1. Flow Diagram for Included Studies

Vital signs have been defined as a clinical measurement that indicates the state of the body's essential function (5). A revised definition of the medical term vital signs is proposed as being based on the following three features: 1) objective findings found during the bedside examination identified through observation (respiration), palpation (pulse), or use of a device (thermometer for temperature and sphygmomanometer for blood pressure) 2) bodily functions which are essential or required for life, and 3) measured noninvasively at the bedside. The only other functions that meets this case definition as a true vital sign are pulse oximetry, the fifth vital sign, which indirectly measures, the oxygen saturation of blood; impedance cardiography and capnography, the sixth vital sign, which measure cardiac output and end-tidal CO_2, respectively (6-18).

PubMed and Medline databases were searched using the individual Medical Subject Headings (MeSH) terms, vital sign and fifth, vital sign and sixth, vital sign and seventh, and vital sign and eighth. The search was limited to human clinical studies written in English literature from 1957 up until November 30, 2021. Information was obtained from multiple sources, including reviews, commentaries, and original research studies. Bibliographies of retrieved papers and reviews and Google searches were assessed to identify additional relevant studies. Titles or abstracts containing the word vital sign and a designated number (fifth, sixth, seventh, eighth) associated with a particular setting, state, disease, disorder, or condition were included in the review. In contrast, articles containing the term vital sign, if used alone without the qualifier fifth, sixth, seventh, or eighth or in the context of temperature, blood pressure, pulse, and respiratory rate, were excluded. Two reviewers independently screened titles, abstracts, and full text for potentially eligible articles meeting inclusion criteria. Differences in inclusion criteria were resolved through consensus adjudication.

Using the MeSH terms, 1,352 papers were identified as the

fifth vital sign, 792 as the sixth, 518 as the seventh, and 266 as the eighth. Biographic and Google search terms identified one additional paper for the fifth vital sign, six for the sixth vital sign, and one for the seventh.. Two articles found within the fifth vital sign search were in reference to the sixth vital sign and moved to that category, while one paper listed pain as the sixth vital sign and retained this designation. Thus, the final dataset available for review consisted of 196 papers (122 for the fifth vital sign, 71 for the sixth vital sign, two for the seventh vital sign, and one for the eighth vital sign) (Fig. 1).

The vital signs consisted of 35 terms grouped into 17 categories with 186 unique first-authored named papers for each vital sign (Table 1). Eleven terms have been called the fifth vital sign, 25 the sixth vital sign, three the seventh, and one as the eighth vital sign. In 103 (51.5%) papers, the word fifth, sixth, seventh, or eighth and vital signs appear in the title; within the remaining 97 (48.5%), the word was identified within the abstract. The terms were found more commonly within the title for the sixth 43 (59%) than the fifth 57 (46.7%) vital sign.

Herein, misconceptions regarding the term "vital sign" as used beyond the four time-honored traditional ones of (temperature, blood pressure, pulse, and respiratory rate) are clarified, and supporting evidence is provided that vital signs should not extend beyond the following seven terms: temperature, blood pressure, pulse, respiratory rate, and non-invasive devices that measure oxygen saturation, end-tidal CO2, and cardia output (15-17). A narrative review was conducted on how the term vital sign has been designated the fifth through eighth and highlighted keywords named for the fifth through eighth vital signs.

Discussion

1. Fifth Vital Sign

Pain took center stage as the fifth vital sign, presumably due to the widespread attention it received caused by the public perception that physicians were not prescribing, and patients were not receiving adequate pain control. Considerable overlap in the term fifth vital sign use has been previously recognized with pain and pulse oximetry (18). Interestingly, weight was designated as the fifth vital sign in adults; and height as the fifth and weight as the sixth in pediatric patients (19,2). Additionally, travel was recently recognized as the fifth vital sign due to the current coronavirus (COVID-19) pandemic and concerns that a travel history should routinely be obtained in order to better recognize early those at potential risk of transmitting infectious diseases (21).

Glucose

Fortmann et al. contended that maintaining glucose homeostasis is essential and should be named the fifth vital sign (5). Although glucose is an important serum measurement, other electrolytes (e.g., sodium, potassium) are required to maintain homeostasis, making this argument less compelling (5). Kaira et al. supported glucose monitoring as the fifth vital sign (22). Although a glucometer measures blood glucose at the bedside, it is invasive and requires a fingerstick. Continuous glucose monitoring devices, although a less invasive method for measuring blood glucose levels, requires a small cannula inserted cutaneously.

Pulse Oximetry

First proposed as the fifth vital sign, pulse oximetry is a non-invasive, readily available, low cost, easy to apply measurement tool that detects mild hypoxemia, particularly in children and the elderly, where it would otherwise be unsuspected (6-14). Physicians found that this tool was more likely to alter their diagnosis and redirect patient management decisions based on the test results (8). Tierney et al. provided further support and justification for using pulse oximetry as the fifth vital sign (7). As previously discussed, pulse oximetry meets our case definition of a vital sign and is a valuable bedside measurement facilitating diagnosis and patient management decisions (7).

Tobacco Abuse and Environmental Tobacco Exposure

Fiore, in 1991, cited 460,000 deaths in the United States from tobacco consumption as the rationale and justification for recommending smoking status as the fifth vital sign (23). This designation was proposed to heighten awareness, draw attention to, and encourage smoking cessation by physicians to combat the growing number of American deaths linked to tobacco abuse (23). Labeling smoking status as a "vital sign" was intended to bring awareness to the problem, significantly increasing the rate physicians now inquire about their patients' smoking status, encouraging them to cease smoking by providing counseling and scheduled follow-up visits (24). Miller also supported the adoption of smoking status as the fifth vital sign citing that it is the top preventable cause of chronic illness and suggested that physicians record the patient's status as current, former, or never smokers (25). Kum-Nji et al. found that the amount of environmental tobacco smoke (ETS) exposure experienced by children correlates with the number of sick visits and that by assessing children's ETS exposure, physicians can identify those at-risk. They recommended that environmental tobacco smoke exposure status be considered the fifth vital sign and recorded at every visit (26).

Pain

James N. Campbell, in his Presidential Address at the American Pain Society forum in 1995, suggested that pain be evaluated as the fifth vital sign (27). Shortly thereafter, the American Pain Society Quality of Care Committee released guidelines calling for a greater focus on pain assessment and relief (28). Since Campbell's initial recommendation, the words fifth vital sign associated with pain frequently appeared in the literature, with debate about whether pain should be considered the fifth vital sign (29-123). Some authors defended its adoption (30,33-37), while others maintained contrary views (18,38-40). Those who support pain as a vital sign argue that it is a subjective self-reportable valuable measurement; few patients become addicted to opioids secondary to pain treatment, and at least 75%

of postoperative pain is not adequately treated (30,33). Saranteas et al. recommended that "P" for pain should be included in the Advanced Trauma Life Support (ATLS) algorithm (34). Opposing views argue that pulse oximetry had already been designated the fifth vital sign and that pain is a symptom and not a sign (18). An overemphasis on pain may have contributed to overmedication and its adverse consequences. In a review of 5,292 trauma center surveys conducted from 1994 to 1998 and 2000 to 2004, overmedication caused by sedatives and narcotics was responsible for 13 to 32 deaths and possibly contributed to another 5 of 14 (37).

In response to critics, Campbell later clarified his address and called for the prioritization of pain assessment, recommending that physicians consider the patient's overall health status before prescribing opioids (44). This led to a shift of focus now directed toward educating healthcare workers in assessing and treating pain and a public "enlightenment campaign" (40-42). Considerable emphasis has been placed on assessing pain in pediatric patient populations and physicians' difficulty in recognizing and evaluating neonatal pain (31,41,42-44). Pain assessments should be made on all children being treated in the health system, followed by periodic assessments as needed using a pain rating scale (31). Treating fetal pain has been shown to result in improved patient outcomes (44).

Weight

Weight has been designated as either the fifth or sixth vital sign in adults and children (19, 20). In 2017, 13% of the adult population or 1.9 billion persons worldwide were obese (19). Scott argued that obesity in adults is associated with adverse health outcomes, including biliary disease, pulmonary emboli, cardiomyopathy, coronary artery disease, diabetes, hypertension, and peripheral vascular disease (19). Emergency nurses are well-positioned to inform and educate patients about these risks (19). Jelinek and Murphy referenced weight as the de facto sixth vital sign in pediatric patients, citing it is "customary and core" to the pediatrician's mission (20). BMI, which represents the ratio of height overweight, was designated as the sixth vital sign (124-127).

Exercise

In 2007, the American College of Sports Medicine launched the Exercise is Medicine initiative encouraging health care providers to assess physical activity as a vital sign and prescribe exercise as treatment or a preventative measure for chronic diseases (128). Sallis et al. recognized the positive relationship between exercise and reduction in cardiovascular and all cause-mortality and that physicians should record the frequency and duration of physical activity at every office visit (129-131). Cowan also supported the adoption of physical activity as the fifth vital sign and the exercise prescription in rehabilitation medicine (132). At the same time, Rozanski et al. highlighted the need to include physical activity as the fifth vital sign for older patients because it is a useful prognostic measurement when combined with coronary artery calcification to predict mortality (133).

Travel

Perl and Price suggested that travel be considered the fifth vital sign (21). They based their recommendation on the increased incidence of geographically identified infectious diseases. They believed that calling "travel" the fifth vital sign will lead to early recognition, diagnosis, and treatment to prevent further disease transmission (21).

Menstrual cycle

The American Academy of Pediatrics in 2006 proposed that the menstrual cycle in an adolescent should be included as part of the routine assessment and as a marker of overall health among patients and their parents (134). Naz et al. called attention to disturbances of the menstrual cycle caused by endocrine disorders as the fifth vital sign (135). Abnormalities involving the menstrual cycle can serve as a surrogate for normal hormonal development and other medical problems affecting this age group (e.g., anorexia nervosa and other eating disorders, mental health issues, and other chronic diseases) (134).

Nurse Worry

Studies have shown that nurses are intuitively able to recognize patients who are likely to deteriorate during their shifts early in the disease course. This concept has been referred to as nurse worry or concern (136,137). Romero-Brufau et al. accessed nurses' perception using a 5-point Likert scale to assess the likelihood that a patient's condition will deteriorate during their shit. They referred to this assessment tool as the Worry Factor (WF) and proposed nurse worry as the fifth vital sign (138).

Discomfort

Naito and Morita proposed that nurse screening for symptoms of discomfort using the Support Team Assessment Schedule in patients with cancer be the fifth vital sign (139,140). This tool aims to determine whether patients require additional palliative care treatment interventions to control symptoms. Although the screening tool was feasible, it failed to demonstrate that it helped identify patients who require additional palliative care support beyond which they were already receiving (139,140). Fraser recommended the routine use of sedation, agitation, and delirium as an overall assessment of patient comfort (141).

These proposed fifth vital signs are summarized under the seven categories consisting of 11 terms (5-14, 18-123,128-141). (Table 1).

2. Sixth Vital Sign

This is the largest category of all designation of vital signs with 25 terms (including pain) among 11 categories, presumably because physicians and other healthcare providers were aware that pain had been previously named the fifth vital sign (142). (Table 1). The sixth, similar to the fifth vital sign, represents a wide variety of categories, including symptoms; diseases; mental, behavioral, and emotional issues; health literacy, perfor-

mance status; measurements, medication compliance, reproduction; screening brief intervention and referral to treatment and digital connectivity (Table 1). Additionally, weight and glucose were classified as the fifth and sixth vital signs, and BMI and medication compliance as the sixth and seventh vital signs (5, 19, 20, 22, 124-127, 143, 201, 202). (Table 1). Highlighted are the key areas named the sixth vital sign.

Mental, Emotional and Behavioral Alterations

The highest frequency of papers designated in the category constituted emotional distress (32,144-171). In 2004, Rebalance Focus Action Group of the Canadian Strategy for Cancer Control proposed that emotional distress be considered the sixth vital sign for cancer patients (32). Others found that screening for psychosocial care reduces both economic and emotional burdens in cancer patients and may improve well-being and quality of life (144-148).

Behavioral disturbances named the sixth vital sign, including depression, fatigue, sleep disturbance, and cognitive dysfunction that may adversely affect compliance, quality of life, and disease-related outcomes (149). Tavani and LeRoy proposed that suffering or "to feel, experience, or endure pain or distress" should be considered the sixth vital sign (150). They emphasized the importance of an empathetic approach and validation of a patient's suffering. Suffering and suicidality were believed to be poorly recognized, and naming as the sixth vital sign would call attention to this problem.

Kaira et al. named well-being as opposed to emotional distress as the sixth vital sign and recommended routine screening and follow-up as part of the comprehensive care of patients with diabetes mellitus (22). Well-being is based on the biopsychosocial model, which encompasses coping, distress, and mood disturbances (depression and anxiety) as part of disease management. Well-being has been proposed as the sixth vital sign in diabetic patients and can be accessed using a two-item questionnaire. Several comorbidities, including depression, distress, and lack of coping skills, are commonly found in patients with diabetes, contributing to patient distress. Recognizing these comorbidities enhances optimal outcomes and improves the quality of these patients' lives (22). Naming well-being as the sixth vital sign for diabetes mellitus addresses key issues involving quality of medical care, interventions, outcomes, and prognosis (22). Kaira justified using this term because it represents a positive attribution rather than a negative one and makes no a priori assumptions whether there is a pre-existing abnormality (22).

In prediabetics and type 2 patients with diabetes mellitus, LaVance et al. proposed that depression screening should be employed as the sixth vital sign (172). The University of Texas Southwestern Medical School program, VitalSign6, employs iPads with depression questionnaires completed by patients while waiting for their appointments. They found that administering the questionnaires during triage serves as a more efficient and valuable screening method for depression (173).

Cognition has been suggested as a vital sign as the brain is involved in memory, executive function, and processing, all of which are "vital" or essential for life. Early detection of dementia provides education, prevents institutionalization, assists families with financial or legal decisions, and improves patients' access to treatment interventions (174).

Delirium is an underrecognized medical condition and represents a marker for an impending or existing severe medical condition. It thereby indirectly reflects the quality or global quality of medical care (175-178). Voyer et al. identified that RADAR (Recognizing Active Delirium As part of your Routine), as assessed by the Confusion Assessment Method, was a moderately sensitivity (70%) and specific (83%) method for detecting altered mental status (consciousness and inattention) (175). Several methods have been used to evaluate attentiveness, including the month of the year backward; Brief Confusion Assessment Method (BCAM), which counts the months from December to July; and "100 countdowns" as proposed by the authors in which the patient counts backward form 100 to 70 (176).

Functional Status and Performance

Addressing functional status is recommended as a key goal in geriatric care, and recording it may improve quality of life (179). Furthermore, improved physical activity in patients who received a functional status intervention further supported the need to enhance awareness of the relationship between functional status and overall health (180).

Slow gait speed predicted decreased health, function, and increased hospitalization (181,182). Fritz and Lusardi argued that walking speed is a perfect measure because it is a reliable, valid, high sensitivity, specificity, and predictive measurement (183,184). Walking speed alone predicted post-hospital discharge 78% of the time. It was found to be a "robust predictor" for functional decline and mortality, supporting its inclusion as the sixth vital sign (184,185).

After implementing fall prevention nursing interventions, Younce et al. reported a 35% decline in falls. They recommended that fall risk assessment be made at every patient encounter, followed by the implementation an intervention, if needed, to help maintain health and safety and limit unreimbursed healthcare costs (186).

Bowel Movement

Holl called attention to bowel movement frequency as the sixth vital sign since it represents a vital symptom of bodily functioning (187). Holl compared the subjective experience of constipation to pain, including its overall adverse effect on overall health and quality of life (187).

Dyspnea

The Registered Nurses' Association of Ontario (RNAO) guidelines called for the adoption of dyspnea as the sixth vital sign in patients with COPD (188). The authors reported that dyspnea is the most disabling symptom of COPD and often leads to increased healthcare visits. The RNAO recommended that facil-

ities develop and adopt strategies to monitor and treat these patients more effectively (188).

Health Literacy

Health literacy can be defined as the extent to which an individual can process and understand basic health information and services needed to make rational health decisions (189). Low health literacy is associated with several negative medical consequences, including poor health status, ineffective management of chronic diseases, and increased cost. In the case of diabetes mellitus, nearly two-thirds screened poorly for health literacy (189,190). Health disparities could be reduced by assessing health literacy as the sixth vital sign (189).

Diagnosis

The World Health Organization in 2011 recommended that HIV status be assessed in all patients in HIV prevalent regions (191). Cummings et al. proposed that HIV assessment and triage of severely ill should be adopted as the sixth vital sign citing that 395 of 2451 Ugandan patients who were HIV positive were more likely to develop shock or die during hospitalization (192).

Urinary incontinence

Incontinence has been proposed as the sixth vital sign to call attention to this problem and its adverse impact on the overall quality of life and well-being (193,194). Labeling it as the sixth vital sign was believed to ensure that patients receive appropriate treatment.

Screening, Brief Intervention and Referral to Treatment

In response to the heightened concerns regarding drug use by addicts, Rundio called attention to the 2012 report by the National Institute of Drug Abuse which estimated that the societal cost of drug abuse was estimated to be 559 billion dollars a year (195). He recommended that the Screening Brief Intervention and Referral to Treatment (SBIRT) tool is a reliable, valid instrument that promotes early interventions, thereby should be routinely used as a screening method in acute care hospitals, as it leads to decreased drug use and reduces societal related costs (195).

Weight

Body mass index (BMI) has been proposed to be a vital sign as it aids in health promotion (124,127). Kirk et al. suggested that BMI should be routinely recorded and patients with BMI scores out of the healthy range be addressed (125). Ballas proposed BMI as the sixth vital sign for patients with sickle cell disease because it is a common comorbidity (126). He justified this recommendation because obesity is an "epidemic" in America associated with an increased risk of type 2 diabetes, hypertension, sleep apnea, cardiovascular disease (126). Jellinek and Murphy mentioned BMI as the de facto seventh vital sign for pediatric patients (20).

Cardiac Output and End-Tidal CO_2

Portable impendence devices measure cardiac output (15,16). End-tidal CO_2 was shown to predict increased in-hospital mortality among patients transported by emergency medical services (17).

Fatigue

Most studies that addressed fatigue as the sixth vital sign were in reference to cancer-related fatigue and stressed the nurses' role in educating patients about the significance of this multidimensional symptom (196-200).

Medication Compliance

Rosenow named medication noncompliance the sixth vital sign and emphasized this vital sign's importance in overall health. Less than 50% of patients are compliant with their medication and regime, with the lack of physician communication being the major contributing factor (201). Medication adherence has also been named the seventh vital sign (202).

Reproduction

Cedars et al. designated reproduction as the sixth vital sign as it serves as a marker for future overall health. Emerging evidence purports an association between infertility and cardiovascular disease (203).

Digital Connectivity

Digital health refers to the digital forms of communication by which patients and physicians access information about a person's health. This may take the form of continuous glucose monitoring and telehealth or virtual health. Klonoff et al. named it the sixth vital sign given its importance to health (204).

These proposed sixth vital signs are included under 11 categories and consists of 25 terms (15-17, 20, 22,32,124-127,142,144-201,203, 204).

3. Seventh Vital Sign

Three phenomena and categories have been designated the seventh vital sign with BMI previously named the sixth and seventh, the latter in children and medication compliance the sixth vital sign.

Place

The seventh vital sign, place, was designated to promote improved primary and secondary care delivery (205,206). Berke argued that making place the seventh vital sign improves access, allocation, and utilization of resources alters group health behaviors, and facilitates the distribution of preventative medicine and public health (205). Geographic information systems (GIS) can relate disease to geographical location and "have the capability to integrate contextual factors of a person's environment with health characteristics" (205). Davenhall developed *My Place History*, which tracks health hazards located near individuals' addresses (206).

Medication Adherence

Magid and Ho argued that medical adherence, "active, voluntary, and collaborative engagement of patients in a mutually acceptable course of behavior to produce a therapeutic result", should be the seventh vital sign (202). They reported that medication adherence is at 50% and is responsible for poor health outcomes, quality of life, and increased healthcare costs and proposed that standard self-report questionnaires on medication adherence and refill data be routinely administered during patient assessment (202). Making medication adherence the seventh vital sign would encourage more dialogue on treatment goals and prescription regimen reviews (202).

These proposed seventh vital signs are summarized under three categories consisting of two terms (20,202,205,206). (Table 1).

4. Eighth Vital Sign

Psychosocial Functioning

Psychosocial functioning is the only term designated as the eighth vital sign (20). These same authors also termed height, weight, and BMI the fifth, sixth, and seventh vital signs in children, respectively.

Jellinek and Murphy suggested that screening for psychosocial functioning in pediatric patients be the eighth vital sign (20). They reported that psychosocial issues have a 10-15% prevalence nationally, are the most common chronic disorder in youth patients, and lead to lower self-esteem, dropouts, drug abuse, risk behaviors, and suicidality. Therefore, the adverse health outcomes associated with psychosocial issues in children merit its adoption as the eight vital sign in pediatrics (20).

These proposed eighth vital signs are summarized under one category and one term (20).

5. Fifth through Eighth Vital Sign

The categories and terms used to describe the fifth through eight vital signs are summarized in Table 1.

Conclusion

The word "vital sign" connotes functions that are essential for life. As such, authors have assigned the prefix fifth through eighth to the word vital signs to define conditions deemed crucial for a physician or allied healthcare provider to incorporate into the practice of medicine. The various symptoms or findings such as psychosocial issues, travel, place, or symptoms were presumably designated as vital signs to draw attention to their importance in overall health and health promotion. However, many of these symptoms and signs extrapolated or informed from the medical history are subjective rather than objective and should not be construed as "vital" for the existence of life but merely ways to improve the quality of life.

Medical terms must be consistent, easily communicated, and distinguishable. This paper is the first to review the literature summarizing how the terms vital signs have been used beyond the four time-honored ones (temperature, pulse, respiratory rate, and blood pressure). Based on our review, it is apparent that misappropriate terms have created overlap, confusion, and mislabeling. Proposes is a working and more restrictive definition of the word vital sign but recognized that stakeholders might not universally endorse this approach. A standard case definition should be used so that everything deemed essential in health does not become lumped together as a vital sign. This would involve establishing a working definition of a "vital sign" using a Delphi technique or consensus expert panel approach.

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Table 1. The categories and terms used to describe the fifth through eight vital signs are summarized.

Categories	Fifth Vital Sign	Sixth Vital Sign	Seventh Vital Sign	Eighth Vital Sign
Digital connectivity		(204)		
Disease				
HIV		(191-192)		
Urinary incontinence		(193-194)		
Exercise	(128-133)			
Health literacy		(189-190)		
Medication compliance		(201)	(202)	
Measurement				
BMI		(124-127)	(20)	

Bowel movement		(187)		
Cardiac Output		(15-16)		
End-tidal CO_2		(17)		
Glucose	(5,22)	(22, 143)		
Height	(20)			
Oxygen saturation	(6-14, 18)			
Weight	(19)	(20)		
Menstrual cycle	(134,135)			
Mental/emotional/behavioral issues				
Behavior		(149-150)		
Cognition		(174)		
Delirium		(175-178)		
Depression		(172-173)		
Discomfort	(139-141)			
Distress		(32,144-171)		
Nurse worry	(136-138)			
Performance status				
Falls		(186)		
Functional/Physical		(179,180)		
Gait		(181-185)		
Place			(205,206)	
Psychosocial functioning				(20)
Reproduction		(203)		
SBIRT		(195)		
Smoking	(23-26)			
Symptoms				
Dyspnea		(188)		
Fatigue		(196-200)		
Pain	(18,27-123)	(142)		
Travel	(21)			
Well-being		(22)		

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