

ORIGINAL ARTICLE

Diagnostic protocols—A consultation tool still to be discovered

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Email: waltraud.fink@gmx.at**Abstract****Rationale:** Experienced primary care physicians handle most illnesses to everyone's satisfaction despite limited resources of time and means. However, cases can be multifaceted in that harmless-presenting symptoms may also be warning signals or an indicator of a health disorder that too infrequently presents in family practice to be diagnosed correctly. On the basis of these observations, RN Braun developed 82 diagnostic protocols for a structured recording of various complaints.**Method:** All consultations during the years 2001 to 2014, in which 1 author (WF) had used diagnostic protocols in her single-handed practice, were analyzed retrospectively regarding reasons for encounter, diagnostic classification, and long-term outcome.**Results:** During the period, a diagnostic protocol was used 1686 times. It was applied at a rate of approximately 5% of 2500 new complaints annually, most often (1366 times) for febrile conditions. In 320 consultations for other complaints, 43 different diagnostic protocols were applied. Among them, the "tabula diagnostica" for various undifferentiated symptoms was used most frequently (n = 54), followed by diagnostic protocols for headache (n = 45), dizziness (n = 36), precordial pain (n = 20), nonspecific abdominal pain (n = 15), low back pain (n = 14), hypertension (n = 12), diarrhea > 1 week (n = 12), epigastralgia (n = 11), depression (n = 10), polyarthralgia (n = 8), cough, and lower abdominal pain (each n = 7). A final diagnosis was established in less than 20% of cases.**Conclusions:** This observational study from routine practice gives an insight how diagnostic protocols helped to manage complex patient presentations. A broader use of diagnostic protocols could investigate the potential of this consultation tool to handle the complexity of primary health care. The use of a standardized diagnostic approach could stimulate research, in particular on managing common complaints/undifferentiated illness and their inherent diagnostic uncertainty.**KEYWORDS**

ambulatory care, complex adaptive systems, diagnostic, guidelines, medical history taking, medical records, signs and symptoms

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1 | INTRODUCTION

A characteristic feature of ambulatory care is the wide range of undifferentiated illness, often self-limiting conditions with no need for further investigation.

Serious diseases are rare. They can present with the typical symptoms of a severe disease and typical signs like acute onset, making

them easily detectable. But in other cases, a disease may develop gradually and may be hidden behind nonspecific complaints or masked by typical symptoms of a harmless disorder. The primary care physician must always stay vigilant to detect a malignancy or another life-threatening condition. Managing the diversity of clinical conditions, family medicine encounters' input and output show complexity characteristics: Katerndahl et al could demonstrate complexity density by quantifying inputs/outputs, being highest in family doctor visits.¹ According to Aitken and Braun, the complex input finds a correlating output in different grades of diagnostic certainty, namely, 90% classify as symptoms, symptom groups, or "pictures" of diseases and only 10% as firm diagnoses.² This 10/90 distribution of diagnostic certainty displays nonlinear (or Pareto) properties.³

The challenge in general practice is to always take common complaints seriously at the first presentation, despite time pressure and other constraints in daily practice, and not to forget asking relevant questions or performing necessary examinations. Finally, with respect to medical and legal requirements, it is important to document positive and negative findings of the consultation. To overcome these potentially harmful consequences of overlooking serious disease in common complaints, the Austrian researcher Robert N Braun,⁴ who worked as a general practitioner from 1944 to 1984, developed diagnostic protocols* (DPs) that act as decision support schemas to assist in differentiating the serious from the benign.^{5–8} They are intended for various, predominantly unspecific, and at first sight harmless symptoms and signs, which can easily entrap the general practitioner (GP) to omit relevant questions and examinations resulting in a premature and potentially erroneous closure of the diagnostic process.⁹

Years of continuously analyzing the elements of the diagnostic process in primary medical care have been the foundation of the DPs. Braun's research focused on making evident the subconsciously developed different diagnostic approaches of experienced practitioners: How have they adapted their diagnostic routine work to the complex setting at the frontline of medicine? What teachable knowledge can be gained by observing them?¹⁰

In an English textbook on primary care, Braun and collaborators from overseas agreed on the following classification of different diagnostic approaches²:

- The "direct approach" tries the immediate identification of a presented complaint. In a patient who tells that something dropped in his eye, the doctor concentrates on finding a foreign body. Or if someone complains about pain and red spots on one side of the waist, explorative history taking is left out because the immediate examination of the affected part of the body will confirm the suspected diagnosis of shingles. Whereas the complaint of recent

rapid weight loss, disgust for meat and vomiting lead to an "extended direct approach." It means that cardinal signs and symptoms lead directly to a group of suspected diseases; in this case, gastric cancer will have to be confirmed or ruled out.

- The "regional approach" concentrates on a strictly localized region, for instance, in a patient with a red eye. The "extended regional approach" considers a variety of diseases in an "extended" region of the body. Pain in the knee also calls for an examination of the lumbar spine, hips, and feet and an assessment of the circulation and reflexes of the limbs. Thinking of a patient with discomfort in the upper abdominal region consideration besides of cholecystitis, gastric or duodenal ulcers, or appendicitis also has to include the possibilities of cardiac or pulmonary diagnoses.
- The most challenging and time consuming approach is the "general approach," when patients present with multiple, nonspecific complaints. A "limited general approach" is applied when leading symptoms or signs guide the exploration and examination of a generally affected person. Examples are febrile conditions or unspecific headache, dizziness, or multiple heart sensations.

"An experienced doctor can deal with all new episodes of illness within this framework," Aitken and Braun wrote.² A pilot study in the authors' (WF and GK) practices quantified the different kinds of approaches—approximately half of the encounters required a regional and a quarter each a direct approach or (limited) general approach.¹¹ Depending on the presenting key signs and/or symptoms, one will consider a number of different diagnoses. Considering a particular diagnosis, one applies—like a stencil ("Schablonen" according to Braun)—the applicable key features for a rapid assessment.[†] It is worth mentioning that these key features emerged from experience in practice. But this attempt of "pattern recognition" is only successful in establishing a diagnosis in a quarter of all presenting complaints; the majority remain nonspecific.¹²

Comparing the complexity density of family practice work with cardiology and psychiatry, Katerndahl concluded that the level of complexity and uncertainty explains general practitioners' experience of higher mental stress and emotional burnout.¹ It was exactly these experiences that led Braun to develop the DPs. Nonlinearity, as encountered especially in family medicine, leads to numerous stressful moments in practice.¹³ Diagnostic protocols should at least reduce the stress of recalling all relevant diseases to be considered and the stress of forgetting which questions have already been asked and which important questions and examinations not to overlook.

Braun developed the DPs by audiotaping routine visits, consulting clinical textbooks, peer discussions, and through testing in daily practice as well as by integrating the professional experiences of specialists. But he stresses that there is a big difference between the comprehensive approach to history taking and physical examination taught at medical schools and its feasibility in routine ambulatory care.

*Diagnostic protocol is the term used by Braun for the German concept: *Diagnostisches Programm*. Other expressions he used synonymously were *Handlungsanweisung*, *Standard*. The French translation is *protocole d'examen standardise* [Braun RN (1979) *Pratique, critique et enseignement de la médecine générale*, PAYOT]. It should not be confused with the prevailing understanding of a "prescription to work by" arising from the EBM-movement. Braun developed these guidelines as a systematic diagnostic decision support tool in the sense that it outlines the questions to be asked and the examinations most relevant now, during the consultation, to overcome or at least to face uncertainty in the complex environment of primary care.

[†]Examples: (1) stencil appendicitis—lower right abdominal tenderness and vomiting, if present makes appendicitis likely; if absent, the diagnosis most likely can be discarded; (2) pneumonia—one-sided crepitations and pleuritic chest pain, if present makes pneumonia likely; if absent, the diagnosis most likely can be discarded; and (3) myocardial infarct—central chest pain/heaviness, radiation into left arm, and sweaty, if present makes myocardial infarct likely; if absent, the diagnosis most likely can be discarded

TABLE 1 The diagnostic fever protocol as used in Fink's practice

Diagnostic Protocol for Undifferentiated Conditions of Fever Braun RN (1964) Med.Welt 15:1320-1328 modified Braun RN, Danninger H (1989)		
Patient name	Age	
Reason for the consultation		Date of consultation
First impression (looks sick?)		
Recurrent problems of this kind?		
Same/less/worse		
Former examination/tests		
Former "diagnosis"		
Former therapy		
In bed (ill) since		
Temperature heights, duration		
Weakness		
Loss of appetite		
Insomnia		
Shivering/sweating		
Rash and other skin eruptions		
General signs/symptoms, other		
Running nose		
Cough and phlegm (white, yellow, greenish, and blood-spotted)		
Sore throat		
Headache and earache		
Pain in the trunk and in arms/legs		
Abdominal pain and other pain		
Vomiting/nausea		
Diarrhea/constipation		
Urinary frequency/alguria		
Menstruation disorders		
Trip to tropic countries/HIV-possible?		
Worried (afraid of)		
Patients' own considerations on the cause of symptoms		
Own treatment and already treated with (by a doctor)		
Other things worth mentioning		
Examination		
Inspection body/legs (erysipelas, etc)		
Discharge of the nose		
Bending neck possible		
Sinus painful on touching		
Lymph nodes (neck)		
Mouth/pharynx		
Examination with otoscope (children)		
Percussion of the lung		
Auscultation of the lung		
Heart auscultation		
Abdomen palpation		
Kidneys (tapping painful)		
Laboratory tests/blood pressure		
Anything else?		
Result of the consultation		
Treatment and referrals		

"Protocols are problem-oriented in that the questions and examinations are related to the possible implications of the particular health problem. The sequence of questions and examinations laid down in a protocol has been adapted from what the experienced practitioner does."² Most protocols serve as an aid for the "limited general diagnostic approach," like the "fever protocol" (Table 1). Independently of Braun's work, SR West in New Zealand had developed diagnostic checklists for the use in his own practice as well. When both met, they found that their lists were quite similar types of protocols for respective complaints. In Braun's monograph, which followed, 15 of the 82 DPs were influenced by their collaboration.⁸

Braun's monograph on DPs is now available in its 5th edition and includes a CD with printable protocols.¹⁴ Little is known about their users and their experiences.

In everyday practice, Braun estimated that 10% to 15% of new health disturbances would benefit from the application of DPs. A prior prospective study deemed their use "appropriate" in up to 24% of cases; however, the actual use of protocols was only 16% during the 1-year observation period.¹⁵ The present study investigates the use of DPs in routine practice over a 14-year period to gain insight into this method for coping with complexity at the medical frontline.

2 | METHODS

All DPs applied by the first author (WF) in her rural practice in Lower Austria between 2001 and 2014 were reviewed. The decision for using a DP had been made intuitively, mainly in situations for which Braun highly recommends their use, e.g., in uncertain diagnostic situations with symptoms where a dangerous development had to be considered immediately. Other reasons included consultations with worried timid patients and in patients with many complaints to structure the encounter. All completed protocols of 14 years were analyzed according to the frequency of their use, reasons for encounter, and the classification of the episode of care. Medical records were reviewed with respect to a noteworthy outcome in the long run.

3 | RESULTS

Between 2001 and 2014, DPs were used in 1686 of about 35 000 newly presenting health disorders. Based on the average annual frequency of 2500 such cases (~200 of them febrile conditions), the overall use of a DP was 5%. Most DPs was applied in fever as reason for consultation (1366 times, i.e., every other fever case) and was approximately 1 in a hundred (i.e., 320 times) in all other kind. Table 2 lists all the DPs used during the observation period.

Most cases remained symptom classifications, "*problems far exceeding that which might be defined as disease.*"¹⁶ In frequent complaints like dizziness, precordial pain, or headache for instance, a diagnosis could be made in only a few patients and is typical in primary care practice.¹⁷

The fever protocol (Table 1) and the tabula diagnostica (Table 3), Braun's first developed DPs, were the most often used ones in the first

author's practice. The fever protocol tries to capture the diagnostic diversity behind the most frequent complaint, fever, whereas the tabula diagnostica is used to scan and record the broad range of "completely obscure syndromes" (Braun). Ten cases (18% of total 54) in which the tabula diagnostica was used resulted in a final diagnosis (see DP no. 67 in Table 3). The remaining 44 episodes of care were classified according to their reason for encounter as symptoms: fatigue, weight loss, nervousness, headache, dizziness, dyspnea, or a combination of "medically unexplained symptoms," most probably not of somatic origin. Table 4 shows the final outcome in DP documented cases of fever: There is a broad variety of underlying causes and classifications for the—at first glance—nonspecific cases of fever. Overall, in only 16% of cases, a DP that used a clinical diagnosis of a disease was reached; in the majority, various symptom combinations prevailed and fortunately disappeared.

4 | DISCUSSION

4.1 | Standardization versus intuition

Family practice is praised, and rightly so, for its person centeredness and for its individuality and intuition-guided approach. Yet what is sensed intuitively is the yield of years of experience. Trainees and residents, in adjusting to the constraints in general medical practice, reduce the standards of inquiry; they were used in hospital.¹⁸ Braun stated that a young doctor does this "according to his discretion. Gradually he learns what can be omitted and what can't. The bill is paid by the patient."¹⁹ Therefore, he advised especially beginners to use the protocols frequently. The "standardized" approach is indicated only in a relatively small proportion of cases, so there still remains enough space for performing individual and intuitive practice.

Diagnostic protocols enable structured, problem-oriented information gathering. They consider the necessary interdisciplinary diagnostic reasoning of a general "all-round type" practitioner.²⁰ DPs cannot replace sound knowledge of pathologies. But by combining the formal elements (indicated questions and examinations) of a DP with one's knowledge, intuition and experience of a patient-centered approach is possible at a higher level. Diagnostic protocols can guide the clinical approach, but they are no guidelines in the sense that an authority recommends steps to follow. They serve as memory aids. Being reminded of respective diseases by the recommended questions and examinations, one can anticipate reaching an earlier diagnosis. The superiority of this method of more efficient diagnostic reasoning and the earlier detection of avoidable dangerous courses of disease has still to be tested in a broad range of practices. As for Braun's own testing:²¹ After 10 years of consulting with DPs, he deliberately stopped using his own diagnostic checklist for nonspecific precordial pain, during an observation period of about a year. The research question was the following: Did the use of the DP for precordial pain over the past 10 years "program him" to know all the questions to ask and all the examinations to perform? The analysis of his audiotaped consultations showed that, on average, he only performed 15 of the 39 DP items. Importantly, a study with standardized (simulated) patients showed that doctors approached the same health problem differently with the next patient.²² So why not recommend

TABLE 2 Frequency of use of the diagnostic protocols (DP) between 2001 and 2014

Illness categories	DP-number in the book (14)	Title of Diagnostic Protocol (DP)	DPs performed 2001-2014 (n=1366)	Noteworthy outcome
Fever, flu-like, respiratory complaints	1	Fever	n= 1366	(see Table 4)
	2	Cough	7	Sarcoidosis
	3	Sore throat	1	
	4	Upper respiratory catarrh	1	
Musculoskeletal	7	Thoracic pain	4	
	8	Lumbar pain	3	
	9	Low back pain	14	
	10	Gluteal pain	2	
	11	Polyarthralgia	8	Aortic stenosis
	13	Shoulder	1	
	16	Neck pain	3	
	80	Muscle cramps	1	
Circulatory	25	Hypertension	12	
	26	Pre-cordial pain	20	Non STEMI
	29	Oedema of the legs	1	
	30	Dyspnoea	4	
	33	Low blood pressure	2	
Abdomen	36	Diarrhoea-1week	12	
	37	Abdominal cramps	1	
	38	Epigastralgia	11	
	39	Lower abdominal pain	7	Colon Carcinoma
	40	Unspecific abdominal discomfort	15	
	41	Constipation	4	Ovarian carcinoma
Skin	43	Jaundice	2	Cirrhosis, Pancreatic cancer
	45	Pruritus	3	
	46	Hair loss	5	
	48	Dermatosis of unknown origin	5	
Ear nose throat	49	Otalgia	2	Acoustic neuroma
	50	Tinnitus	1	
	52	Burning tongue	2	
Nervous system	18	Facial bell's palsy	1	
	24	Dizziness	36	
	60	Depression	10	
	61	Nervousness	1	
	65	Tremor	3	
	66	Psycho-social problems	2	
	70	Headache	45	
	71	Insomnia	3	Pruritus analis
	72	Syncope	3	
Miscellaneous complaints	73	Unspecific fits/attacks	4	
	67	"TABULA DIAGNOSTICA"	54	Diagnoses n=10 (18%): Lymphoma, Brain tumour, Polymyalgia rheumatica (2), Coronary heart disease, Depression(2), Esophagus ulcer, worsened chronic heart failure with leg arterial embolism, Multiple sclerosis All other episodes (n=44) remained Symptom(s) classification
	77	Lymph nodes	1	
	81	Anaemia	1	
	82	Illness after return from tropic regions	2	
			n= 320	Total number of protocols except for febrile conditions

that doctors use DPs right away, as an *aide memoire* for the consultation?[‡]

4.2 | Facing danger and managing risks

On the frontline of medicine, we often experience the inappropriateness of the current taxonomy of disease. Administrative and managerial agendas demand a diagnosis at the end of the consultation.²³ They are

[‡]An anecdote to illustrate this point from a conversation with Braun in the early 90s: I (WF) remember discussing peer group performance review in the Netherlands. Colleagues had to fill in a form, according to the newly developed guidelines, after the consultation, if they had asked all relevant questions and performed the necessary examinations [Grol R et al (1988) Peer Review in General Practice. Nijmegen University]. Braun's comment: "We do know that we forget things. They should use the 'guideline' as a diagnostic protocol during the consultation! Besides that, why didn't they just take our published DPs and work and research on them, instead of trying to invent the wheel again?"

TABLE 3 Braun's tabula diagnostica (DP no. 67), adapted by the first author (WF) for the use in the electronic patient record

Patient Name	Age	First Impression										Patient's view on his/her illness - Fears				
		Years					Months					Days				Date of Consultation
		10	8	5	3	2	1	6	3	2	1	14	7	3	2	
Main complaint																
Fever (chills)																
Rash																
Rhinitis/epistaxis																
Difficulty swallowing																
... ache/pain																
Paresthesia																
Paralysis																
Fits																
Cramps																
Traumas, mental, or others																
Pyogenic infections																
Dyspnea																
Tachycardia																
Edema																
Diarrhea																
Constipation																
Jaundice icterus																
Pallor																
Nausea/vomitus																
Pollakiuria/oliguria																
Alguria																
Weakness																
Listlessness																
Anorexia																
Loss of weight																
Thirst																
Hyperhidrosis																
Vertigo																
Insomnia																
Menses/pregnancy																
Bleeding																
Treatments																
Occupational exposure to toxins																
Travel (tropics)																

Abbreviation: DP indicates diagnostic protocol.

Examination: looks ill _

Conjunctivae _ pupils _ meningism _

Ears _ mouth _ pharynx _ lymph nodes _ Thyroid _

Joints _ spine _ Patellar/Achilles reflexes _

Skin _ Rhomberg _ Babinski _

Chest _ Blood pressure _ Pulse _

Abdomen _ digital rectal examination _ loin tenderness _ urine analysis _

Investigations ordered _ follow-up consultations _

Consultation result:

often just labels, or mere guesses, provided solely to meet these expectations. Practice reality needs wise methods for handling undifferentiated illnesses to manage the risk arising from uncertainty.

Watchful waiting (*Abwartendes Offenlassen*—Braun)²⁴ has become a widely used concept to manage undifferentiated conditions in primary care.¹³ It is the mode of staying vigilant in the face of uncertainty in

TABLE 4 Final clinical diagnoses or symptom classifications in the DP-documented cases of fever (2001-2014)

Diagnostic Fever Protocols (N = 1366)—Classification of the Episodes of Care					
Final Clinical Diagnosis n = 224 (16%)			Symptom Classification n = 1140 (84%)		
	n		n		n
Tonsillitis/strep throat	69	Wound infection	2	Unspecific fever/flu-like illness	1060
Pneumonia	52	Phlegmon	1	Nonfebrile, unspecific syndrome	52
Acute bronchitis	37	Mastitis puerperalis	1	Upper respiratory tract infection	4
				Cough	2
Otitis media	12	Myocarditis	1	Acute pharyngitis, unspecified	1
Sinusitis	9	Lung cancer	1	Fever > 1 week	2
Scarlatina	5	Campylobacter	2	Susceptibility to infection	2
Exanthema subitum	1	Gastrointestinal bleeding	1	Vomiting/diarrhea	11
Marigold rubella	1	Cholangitis/cholecystitis	1	Abdominal cramps	1
Croup	1	Appendicitis	3	Unspecific abdominal complaints	2
Hand-foot-mouth disease	1	Cystitis	15	Epigastralgie	1
Erysipelas	2	Bartholinitis	1	Nausea	1
Lymphadenitis	1	Stomatitis aphthosa	4	Neuralgic complaints	1

Abbreviation: DP indicates diagnostic protocol.

general practice. A core issue is which diagnostic steps have to be taken before allowing a watchful waiting approach? In medical school, we are taught to consider a broad spectrum of differential diagnoses based on a thorough history and time-consuming examination. But reality in daily practice “demands” to work fast and cost effectively.

In a phenomenological and epidemiological approach through practice observations, Braun founded his own categorization of primary care consultation outcomes. He defined the regularly encountered illnesses as “kasugraphic” entities, as opposed to the known nosographic disease concepts.²⁵ His concepts leave enough space for individual development in the fields of diagnostics but provide a characterization of epidemiologically based terms which are communicable and comparable. Oscar Rosowsky, who helped translate them into French (“La Casographie”), simply calls these primary care specific entities “scènes du danger.”²⁶ The description of each kasugraphic concept contains the most important avoidable dangerous diseases to be considered. Diagnostic protocols can be seen as specific diagnostic tools to face “danger.”

So far, a standardized DP approach has been developed for about a quarter of the 300 defined kasugraphics. Thirty of them are recommended for the first encounter, others if complaints persist. Braun highly recommends about a dozen DPs for the following encounters:

- Unspecific fever
- Intractable low back pain
- Precordial pain
- Hypertension—first assessment
- Polymorph, unspecific heart sensations
- Heart failure suspected
- Dyspnea
- Hemoptysis
- Unspecific abdominal pain
- Abdominal cramps
- Epigastric pain

- Depression
- Dizziness
- Headache

4.3 | From the patients' point of view

The advantages of the most elaborated DP, the “fever protocol,” are similar to the checklists pilots use before takeoff. Particularly in flu-like febrile conditions, it should be pointed out that typical specific signs or symptoms may develop after a practice visit. Of note, while asking all the questions in the fever protocol, we also raise the awareness in patients for the symptoms and signs they have to watch out for. And because of this, they will know better when to consult again. Thus, it may facilitate shared responsibility and shared decision making, this being also a method to deal with the uncertainty of a condition. Taking into account, the patient's perspective—we know how nervous they can feel—in the doctor's office “*not only the experienced practitioner forgets notable details concerning the consultation, but the patients too.*”¹⁹ Patients have repeatedly stated that consultations with DPs gave them empowerment as persons and satisfaction with the thorough problem-orientated medical examination performed. For the physician, it is reassuring to have at least detailed records documenting that the best possible was done for a patient at that particular time, meaning that various possible dangerous developments—“Respectanda” according to Braun²⁴—had been considered.

4.4 | Clinical illustrations

Three cases will be presented to illustrate the use of different DPs, and specific primary care research questions are raised.

1. In a man in his 70s, at first, a diagnostic protocol for tinnitus and a year later one for depression was performed. His complaints were classified as such. After another year, he gradually developed symptoms and signs of dementia. Research questions that arise from this case include the following:

Is there a clinical connection between the presentation of tinnitus and the later diagnosed dementia or were they occurring accidentally one after the other? May tinnitus indicate the beginning of dementia?

2. In a 40-year-old woman complaining of years of aches and pains in almost every joint, a DP, the "Arthralgia checklist" was used. Answering the questions, she mentioned a sensation "as if something was pulling her legs off" and she mentioned also numbness in her big toe. Besides a consultation with a rheumatologist, she was referred to a neurologist. A report from a department of neurology came a year later. Multiple sclerosis was suspected. The tabula diagnostica helped to document the multiple symptoms 1 year before the diagnosis of the disease. This occurred at a stage when the presenting symptoms could not be explained with any degree of certainty. Research questions that arise from this case include the following: Would an earlier diagnosis in this multifaceted case have been possible at all? Multiple sclerosis is a difficult diagnosis; how reliable are the sophisticated multiple sclerosis-specific tests in the early stages of the disease?
3. A teacher, almost 60, complained about loss of energy. During the visit, the tabula diagnostica was applied, and new-onset atrial fibrillation was the only alarming finding. A check in hospital ruled out suspected heart failure. He had regular visits to monitor his coumarin therapy. His fatigue had settled. There were no hints of the final diagnosis over the next 3 years when, in a drowsy moment, the patient ran into a car: a large brain tumor was detected. Research questions that arise from this case include the following: Do the symptoms of loss of energy/fatigue warrant a more liberal indication for cerebral imaging? What could be the "red flag signs" indicating the urgent need for cerebral brain scans?

Time plays an important role in clinical decision making. Many symptoms disappear making the probability of an underlying disease requiring treatment much lower.²⁷ However, for general practitioners who provide continuous care, counting on time is a double-edged sword: In one case, we may be on alert if a symptom persists, and in another, it can be (dangerously) soothing ("*he/she always has had these complaints*"). As the third case illustrates, the family physician may also be reassured by the outcomes of a hospital-based review and no longer track the complained "loss of energy." Looking back, the brain tumor might have been detected by cerebral imaging right after applying the diagnostic approach using the tabula diagnostica. Yet his prognosis would have remained poor, but at least the accident could have been prevented as well as the bad injuries that made him bedridden long before the symptoms of the tumor too caused it. Equally early diagnosis and early interventions may not have prevented his demise but might have decreased his quality of life in the interim.

All 3 case studies illustrate the inherent complexities of medical care in family practice. General practitioners are confronted with issues of early detection, the impact of continuity, and lack of continuity of care, determining the "normal" duration of self-limiting illnesses, deciding when to adopt a watchful waiting approach or performing further investigations. What are particular "red flags" in certain complaints?

In general, every DP provides comprehensive documentation of questions and answers at the time of the respective consultation. These questions are posed during routine consultation. There is little doubt

that the systematic adoption of DPs could provide a wealth of information from routine practice and the meaning of red flags with respect to the course and outcome of different illnesses. These findings could help many more physicians to better handle especially common complaints with a low diagnostic yield at the front line of medicine.

4.5 | DPs as work in progress

Braun's process of developing the DPs was straightforward and simple when compared with group consensus approaches like the Delphi procedure.²⁸ However, he considered DPs as "work in progress," constantly optimizing the extent of items (for the interview and for the examination of the patient) in response to practical experience in practice. Feasibility was his main objective.² Diagnostic protocols were introduced before computers had entered our practices. But when one of his trainees, Wolfgang Edinger, worked on electronic medical records with an integrated decision support system ("Leitwegsystem"), Braun saw his DPs serve as prototypes for this project.²⁹ Hence, the future of the DPs may lie ahead as an adequate tool to reduce family medicine's needs to address the complexities of primary care consultations.^{1,13,30,31}

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Waltraud Fink provided data and wrote the manuscript. Gustav Kamenski and Martin Konitzer contributed their own practice experience and helped with drafting the manuscript.

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