Factors 1st round	Factors 2nd round
	Breathing Frequency Depth
Work of breathing Volume of speaking	Use of accessory muscles Pace and volume of speaking Breathing noises
Skin (color, mottled)	*Skin* Color
Feeling of the touch	Aspect Temperature
Awareness/consciousness	*Awareness/consciousness*
Eyes (color, shine, dullness) Eye contact	*Eyes (glance)*
	Mucosae Dehydration Swelling Blood
Age Biological age	*Biological age-calandar age discrepancy*
Posture/attitude Young patient not using smartphone Eating or drinking	*Posture/attitude*
Observation of family members Observation by general practioner (GP) Stress ambulance/hectic environment Observation nurse	*Behavior people around*
Mood (anxiety, agitation) Mimicry/facial expression Culture	*Frame of mind*
Smell	*Smell*
Selfcare Nutritional status	*Self-care (neglect)*
Interventions ambulance	*Interventions ambulance*
Mobility after arrival at ED	*Mobility*
	Red flags physical examination
Presenting complaint Feeling of faining	*Presenting complaints*
How ill does the patient feel Patients feels that he/she is dying	*Own impression* Patient GP
Impression of family members	Family
Where does the patient come from (having a) Network	*Socioeconomic status* Living situation Residence Profession
Level of functioning	*Pre-existing level of functioning*
Transportation	*Type of transportation to hospital*
How late does the patient arrive	*Presenting at evening, night or weekends*

Medication Medical history Alcohol/smoking/drugs	*Patient information* Medication Medical history Alcohol/smoking/drugs
Arterial blood gas analysis Ultrasound	*Additional diagnostics* ECG ABG Ultrasound
Impression of monitor	*Monitor vitals*
ABCDE	
Triage color	

Supplemental Table S1. Results of the NTG workshop

Clinical impression score

NB: for each item it is mandatory to provide an answer, where you would fill in "not applicable" fill in "no". Do not enter any identifying information on the form other than the participant number.

Participant ID		**Initials research assistant**	
Date (DD-MM-JJJJ)	..... - ..... - 20	**Signature Project Manager**	

What is your position?	O Student O Physician in training O Medical specialist O Nurse		
How many years of working experience have you had since graduating?	..... year		
How ill is the patient?	[not ill] 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 [very ill]		
Which items contributed significantly to your clinical impression?			
Presenting complaint	yes / no	Behavior	
Way of transport to hospital	yes / no	Patient	yes / no
Comes in the evening, night or weekend	yes / no	Family	yes / no
Ambulance interventions	yes / no	Ambulance staff	yes / no
Breathing		ED staff	yes / no
Frequency	yes / no		
Depth	yes / no	Mood	
Accessory muscles	yes / no	Mimicry	yes / no
Speaking-pace	yes / no	Emotions	yes / no
Speaking-volume	yes / no	Mobility (e.g. from stretcher to bed, cooperation during physical examination, toilet use)	yes / no
Breath sounds	yes / no		
Skin		Estimation	
Color	yes / no	of patient himself	yes / no
Aspect	yes / no	of family	yes / no

Temperature	yes / no	of the GP	yes / no
Mucous membranes		Worsening of functioning	yes / no
Dry	yes / no	Job	yes / no
Swelling	yes / no	Living situation	yes / no
Blood	yes / no	Residence	yes / no
Smell	yes / no	Patient data	
Self-care / neglect	yes / no	Medical history	yes / no
Consciousness	yes / no	Medication	yes / no
		Intoxication (alcohol, smoking, drugs)	yes / no
Eye glance	yes / no	Red Flags physical examination	yes / no
Calendar age	yes / no	Vitals bed-side monitor	yes / no
Estimation of biological age	yes / no	Additional diagnostics	
Habitus (lying down, sitting, fetus)	yes / no	ECG	yes / no
		Ultrasound	yes / no
Posture	yes / no	arterial blood gas analysis	yes / no

Supplemental Figure S1. Case record form employed to obtain the clinical impression score and identify features associated with the clinical impression by physicians and nurses at the ED.

Variables	**% [n/N]**	**Regression Coefficient (95% CI)**	**p-value**
Presenting complaint	86% [436/510]	-0.07 (-0.59-0.46)	0.81
Way of transport to hospital	44% [222/513]	0.58 (0.22-0.95)	0.002
Comes in the evening, weekend, night hours	25% [127/508]	0.18 (-0.25-0.60)	0.42
Ambulance interventions	27% [136/508]	0.81 (0.39-1.22)	<0.001
Breathing			
Frequency	65% [337/517]	0.49 (0.11-0.87)	0.01
Depth	44% [227/515]	0.55 (0.18-0.91)	0.004
Use of accessory muscles	42% [213/513]	0.55 (0.18-0.92)	0.004
Speaking-pace	45% [231/513]	0.08 (-0.29-0.45)	0.68
Speaking-volume	37% [192/513]	0.35 (-0.03-0.73)	0.07
Breath sounds	40% [205/513]	0.49 (0.12-0.86)	0.01
Skin			
Color	51% [253/516]	0.75 (0.38-1.11)	<0.001
Aspect	30% [153/512]	0.58 (0.18-0.98)	0.005
Temperature	45% [233/512]	0.36 (-0.001-0.73)	0.05
Mucous membranes			
Dry	25% [126/515]	1.28 (0.87-1.69)	<0.001
Swelling	7% [36/513]	0.36 (-0.36-1.08)	0.33
Blood	9% [46/515]	0.57 (-0.07-1.21)	0.08
Smell	9% [48/510]	0.89 (0.26-1.52)	0.005
Selfcare/neglect	22% [113/513]	0.41 (-0.03-0.85)	0.07
Consciousness	55% [286/516]	0.15 (-0.22-0.52)	0.43
Eye glance	64% [328/516]	0.82 (0.44-1.19)	<0.001
Calendar age	28% [145/515]	0.46 (0.05-0.87)	0.03
Estimation of biological age	31% [156/512]	0.62 (0.22-1.01)	0.002
Habitus (lying down, sitting, fetus)	48% [245/513]	0.42 (0.05-0.78)	0.02

Posture	29% [148/514]	0.67 (0.26-1.07)	0.001
Behavior			
of the patient	61% [314/514]	-0.17 (-0.54-0.21)	0.39
of the family	18% [93/507]	-0.49 (-0.97- -0.02)	0.04
of the ambulance staff	19% [95/506]	0.63 (0.18-1.08)	0.01
of the ED staff	21% [104/506]	0.84 (0.37-1.31)	0.007
Mood			
Mimicry	37% [188/513]	0.33 (-0.05-0.71)	0.09
Emotions	29% [147/512]	-0.17 (-0.58-0.24)	0.41
Mobility	56% [283/510]	0.24 (-0.13-0.61)	0.21
Estimation			
of the patient himself/herself	35% [179/514]	-0.54 (-0.92- -0.16)	0.006
of the family	21% [106/510]	-0.21 (-0.66-0.25)	0.37
of the GP	22% [111/511]	0.57 (0.13-1.01)	0.01
Worsening in functioning	47% [241/515]	0.71 (0.35-1.07)	<0.001
Profession	2% [12/515]	0.79 (-1.14-1.29)	0.90
Living situation	14% [72/513]	0.96 (0.44-1.49)	<0.001
Residence	3% [16/511]	1.54 (0.49-2.60)	0.004
Medical history	78% [401/466]	-0.32 (-0.76-0.12)	0.16
Medication	43% [224/513]	0.20 (-0.17-0.57)	0.23
Intoxications (alcohol, nicotine, drugs)	16% [84/513]	0.14 (-0.36-0.64)	0.58
Red flags during physical examinations	57% [293/511]	1.26 (0.90-1.61)	<0.001
Vitals bed-side monitor	75% [381/510]	0.88 (0.46-1.30)	<0.001
Additional investigations			
ECG	34% [176/511]	0.11 (-0.28-0.50)	0.58
Ultrasound examination	16% [81/512]	1.04 (0.55-1.54)	<0.001
Arterial blood gas analysis	52% [269/514]	0.97 (0.61-1.32)	<0.001

Supplemental Table S2. Univariate linear regression analysis of clinical impression features with the clinical impression score. Shown is the relative and absolute number of cases where the health care professional identified the factor as contributing to the clinical impression score, as compared to the total number of respondents on the specific impression feature (% [n/N]). Mobility was judged on moving from stretcher tot bed, cooperation during physical examination, toilet use. RC: regression coefficient, CI: confidence interval.

Variable	**N (%) / median (IQR) / mean ±SD**	**RC (95% CI)**	**p-value**
Age	517 (100%)	0.03 (0.01-0.04)	<0.001
Gender	517 (100%)	-0.06 (-0.43-0.31)	0.74
Heart rate (bpm)	96 (69-123)	0.01 (0.003-0.02)	0.008
Systolic blood pressure (mmHg)	128 ± 23	-0.01 (-0.02- - 0.004)	0.004
Diastolic blood pressure (mmHg)	77 ± 17	-0.02 (-0.03- -0.01)	0.003
MAP (mmHg)	94 ± 18	-0.02 (-0.03- -0.01)	0.001
Respiration rate (rpm)	21 (13-29)	0.09 (0.06-0.12)	<0.001
Oxygen saturation (%)	96 (91-102)	-0.10 (-0.14- - 0.06)	<0.0001
Oxygen modality (%)	1 (0-2)	0.82 (0.63 – 1.00)	<0.001
Temperature (°C)	37.0 (35.8-38.2)	-0.08 (-0.23- -0.07)	0.28

Glasgow Coma Scale	15 (13-15)	-0.28 (-0.39- -0.18)	<0.001

Supplemental Table S3. Univariate linear regression analysis of demographic factors and vital parameters with the clinical impression score. IQR: interquartile range, RC: regression score, CI: confidence interval, bpm: beats per minute, MAP: mean arterial pressure, rpm: respirations per minute, SD standard deviation.

Variables	RC (95%CI)	p-value
CIS: Mucous membranes, dry	0.79 (0.28-1.29)	0.002
CIS: Eye glance	0.55 (0.07-1.03)	0.024
CIS: Behavior of the family	-0.97(-1.56- -0.37)	0.001
CIS: Estimation of the patient himself/herself	-0.74 (-1.20- -0.27)	0.002
CIS: Red flags during physical examinations	0.93 (0.47-1.38)	<0.001
Respiration rate (rpm)	0.57 (0.10-1.06)	0.018

Supplemental Table S4. Validation of multivariate linear regression model in infection group. Clinical impression features that associated with the clinical impression score in the multivariate regression model ($p<0.05$, Table 3) were validated in 307 patients with infection by associating the factors with the clinical impression score in a multivariate linear regression analysis (enter). RC: regression score, CI: confidence interval. Model characteristics: $R^2=0.20$, Adjusted $R^2=0.21$, df=6 , F=11.68, $p<0.05$.

Variable	RC (95%CI)	p-value
CIS : Mucous membranes, dry	0.74 (0.21-1.28)	0.00
CIS: Eye glance	0.79 (0.31-1.28)	0.00
CIS : Estimation of the patient himself/herself	-0.67 (-1.16- -0.18)	0.01
CIS : Red flags during physical examinations	1.01 (0.56-1.46)	.<0.001
CIS: Behavior family	-0.80 (-1.40- -0.19)	0.01
Triage urgency	0.78 (0.31-1.26)	0.00
Heart rate (bpm)	0.02 (0.01-0.03)	<0.001
Respiration rate (rpm)	0.04 (-0.002-0.07)	0.03
Oxygen modality	0.25 (-0.006 – 0.51)	0.06
Age	0.02 (0.004-0.04)	0.02
Temperature	-0.19 (-0.39- -0.002)	0.05

Supplemental Table S5. (Table S5 Validation of multivariate linear regression model in infection group. Clinical impression features, vital parameters and demographic data that associated with the clinical impression score in the multivariate regression model ($p<0.05$, Table 4) were validated in 307

patients with infection by associating the factors with the clinical impression score in a multivariate linear regression analysis (enter). RC: regression score, CI: confidence interval. Model characteristics: R^2=0.43, Adjusted R^2=0.40, df=13, F=14.82, $p<0.05$.