



# Analysis of daily goal sheets on physician-nurse collaboration attitude

Xin Qian<sup>1</sup>, Li Jun Li<sup>1</sup>, Yi Yu Zhuang<sup>2</sup>, Yu Cai Hong<sup>1</sup>, Zhong Heng Zhang<sup>1</sup>, Li Feng Xing<sup>1</sup>, Ning Liu<sup>1</sup>, Hong Chao Li<sup>3</sup>, Ru Jin Zhang<sup>4</sup>, Fu-Chih Lai<sup>5</sup>, Charles B. Simone II<sup>6</sup>, Edward Chow<sup>7</sup>; Written on behalf of AME Nursing Research Collaborative Group

<sup>1</sup>Department of Emergency Intensive Care Unit, <sup>2</sup>Department of Nursing, Sir Run Run Shaw Hospital, Hangzhou 310016, China; <sup>3</sup>China Pharmaceutical University, Nanjing 210009, China; <sup>4</sup>Department of Anesthesiology, Qingdao United Family Hospital, Qingdao 266313, China; <sup>5</sup>College of Nursing, Taipei Medical University, Taipei; <sup>6</sup>Department of Radiation Oncology, New York Proton Center, New York, NY, USA; <sup>7</sup>Department of Radiation Oncology, Odette Cancer Centre, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada

*Contributions:* (I) Conception and design: YY Zhuang; (II) Administrative support: YC Hong; (III) Provision of study materials or patients: N Liu; (IV) Collection and assembly of data: LJ Li, LF Xing; (V) Data analysis and interpretation: ZH Zhang; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

*Correspondence to:* Yi Yu Zhuang. Department of Nursing, Sir Run Run Shaw Hospital, Hangzhou, Zhejiang Province 310016, China. Email: zhuangyy@zju.edu.cn.

**Background:** Optimal communication and collaboration between inter-disciplinary health care providers is critical to ensuring high quality patient care. We aimed to quantify the impact on physician-nurse collaboration (PNC) of implementing daily goal sheets (DGSs) in emergency settings.

**Methods:** The usage of a DGS was administered in morning rounds in an emergency intensive care unit (ICU) for four consecutive months. A Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration (JSAPNC) form was used before (n=113) and after (n=107) the intervention to evaluate the attitudes of PNCs from the perspective of both physicians and nurses.

**Results:** There is a significant positive relation between the attitude to PNC and the participant age, educational background, and professional rank and title before DGS application ( $P < 0.01$  for each), whereas there was no significant difference observed after the initiation of the DGS.

**Conclusions:** The use of a DGS improves physician-nurse collaborations in emergency care settings.

**Keywords:** Emergency intensive care unit (EICU); daily goal sheet (DGS); physician-nurse collaboration

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## Introduction

Inter-professional collaboration is critical to optimize patient care and outcomes. Teamwork and collaboration between physicians and nurses are foundational components of professionalism, as they have been closely linked to improvements of health outcomes and quality of patient care (1,2). Benefits of positive inter-professional collaboration include reduction of the mortality rate in in-patient settings (3), increase of job satisfaction (4), improved maintenance of patient safety (5), and lowered health care

costs (6).

Inter-professional collaboration is defined as “when multiple health workers from different professional backgrounds work together with patients, families, carers (caregivers), and communities to deliver the highest quality of care” (7). It is based on the concept that when providers consider each other’s perspective, in addition to that of the patient, they can deliver better care.

Modern intensive care requires a sophisticated, well-coordinated delivery system consisting of both advanced technology and a well-integrated, and highly skilled team.

Although significant advances have improved the care and outcomes of many critically ill patients, the complexity and stress of the intensive care unit (ICU) setting nonetheless predispose these units to considerable medical error, which can be of grave consequence. In fact, failure to implement the best evidence-based interventions in the ICU has been estimated to cause 160,000 avoidable deaths each year in the United States (8). Research has found that the implementation of interventions, including the use of checklists during daily multidisciplinary rounds and clinician prompting, is able to reduce mortality and improve other relevant outcomes for patients (9).

Checklists have been successfully employed in aviation and the manufacturing industry to avoid critical omissions during complex procedures (10), and they have also been successfully used in health care. Notable examples are the World Health Organization Checklist for Safe Surgery (11) and the Keystone ICU Project checklist to prevent central line-associated bloodstream infections (12). In select centers, checklists have also been used during daily multidisciplinary ICU rounds to avoid errors of omission (13) and, together with daily goals assessment, may improve the effectiveness of inter-professional communication (14). In addition, the effectiveness of the checklists themselves can be leveraged by systematically prompting physicians and other providers to address omitted items (15).

In the healthcare field, poor communication is often cited as a root cause of medical errors. Effective teamwork and good working relationships can reduce errors and improve outcomes. This relationship between inter-professional communication, quality of care, and patient safety is highlighted in several Institute of Medicine (IOM) reports (16-18).

Prior reports have demonstrated that using a daily goal checklist improves physician-nurse communication and leads to better patient outcomes in the surgical ICU (19), while also facilitating the understanding of work flow and daily goals by residents and nurses, furthermore mutually enhancing communication.

When a campaign of quality improvement was launched on December 15<sup>th</sup>, 2016, we designed and initiated a daily goal sheet (DGS) as a tool to enhance departmental safety culture in the emergency intensive care unit (EICU), while facilitating team collaboration and communication. The DGS is a one-page checklist with a fixed structure for each day of the week that includes the patient name and diagnosis and the assigned attending physician and nurse.

It directs team members to set, for each patient, a clear daily goal concerning care and treatment (20). The DGS assesses patient organ systems, collects interventions, and additionally reminds team members to be attentive to the mutual understanding and communication with patients and family members.

This study was designed to evaluate both the effectiveness of implementing the DGS, and any attitude change concerning physician-nurse collaboration from the April 15<sup>th</sup>, 2017 to October 15<sup>th</sup>, 2017.

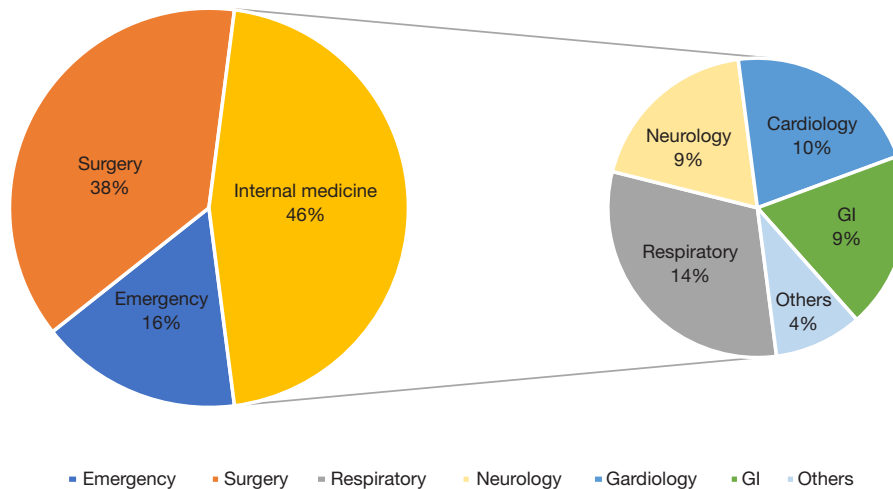
## Methods

### Setting

The study was performed in an EICU of 10 beds. The annual population of the patients in the EICU is shown in *Figure 1*. Our emergency setting averages 498 admissions per year and the majority of patients (73.5%) require mechanical ventilation. The mortality of patients is 2.2% with the average length of stay (LOS) of 4.97 days. All physicians and nurses were informed of the purposes of this study. Questionnaires were administered to 65 regular staff physicians, excluding advanced training physicians and rotating physicians. Fifty-seven valid questionnaires returned completed, with a physician response rate of 87.7%. Similarly, 172 questionnaires were administered to nurses, and 154 valid responses were collected, with a nursing response rate of 89.5%.

### Intervention tool

The DGS was designed according to the specific departmental concerns for patients and highlighted each system feature that is habitually and has historically been easy to overlook, which contains 17 categories, includes patient status (sepsis/shock/MODS, CVS, Resp sys, Neuro sys, GI sys, Uro sys, Coagulation/Blood sys, nutrition, infection, tubes *in situ* and extubation indicators, deep-vein thrombosis (DVT) prophylaxis, sedatives and analgesia, delirium, sleep, rehabilitation, and specific requests from family members. During each day's morning round, the most senior physician of every medical team was requested to set a daily goal, treatment plan and evaluation parameters, aiming to explore and find the most important clinical needs. The DGS was applied to every consecutive patient within the EICU during morning rounds from December 15<sup>th</sup>, 2016 to April 15<sup>th</sup>, 2017.



**Figure 1** The annual population of the patients in EICU. EICU, emergency intensive care unit.

**Table 1** Comparison before and after DGS intervention concerning physician and nurse responsibility in item 3

Item	Before (n=107)		After (n=104)		t	P
	Mean	SD	Mean	SD		
Item 3	2.880±0.765		3.110±0.828		-2.116	0.036

Item 3: there are many overlapping areas of responsibility between physician and nurses.

### Survey tool and details

Control studies were conducted before and after the implementation of the DGS. The details were as follows: (I) general information, which included gender, age, educational background, professional rank and title, and number of years of working experience; and (II) Attitudes Toward Physician-Nurse Collaboration to evaluate the attitude to PNC.

These items addressed areas of physician-nurse interaction including authority, autonomy, responsibility for patient monitoring, collaborative decision-making, and role expectations. The scale comprises four dimensions: dimension 1, shared educational and collaborative relationships (items 1–7); dimension 2, caring as opposed to curing (items 8–10); dimension 3, nurse's autonomy (items 11–13); and dimension 4, physician's authority (items 14–15). These were answered on a 4-point Likert-type scale (4= strongly agree, 3= agree, 2= disagree, 1= strongly disagree) (21). A higher score meant a reflection of a more positive attitude toward PNC.

### Statistical analysis

The raw data were recorded in Microsoft Excel and analyzed by Student's *t*-test and Pearson's correlation coefficient on SPSS 22.0. A P value <0.05 was defined to represent a statistically significant difference.

## Results

### Item comparison towards PNC before and after DGS

There was considerable statistically significant difference before and after DGS concerning physician and nurse responsibility in item 3 (Table 1).

### Influential factor comparison before and after DGS regarding PNC

Before the DGS, there was a positive relationship with age, educational background, and professional rank and title towards physician-nurse collaboration attitude. Following the DGS, however, there was no observed significant relationship with gender, age, educational background,

**Table 2** Correlation between influential factors with total score (Pearson's correlation)

Factor	Before DGS		After DGS	
	R	P	r	P
Gender	-0.149	0.121	-0.098	0.317
Age	0.241*	0.013	0.166	0.090
EB	0.258**	0.007	0.154	0.119
PR&T	0.208*	0.032	0.175	0.076
Years (WE)	0.082	0.395	0.123	0.207

EB, educational background; PR&T, professional rank and title; WE, working experience. \*,  $P < 0.05$ ; \*\*,  $P < 0.01$ .

**Table 3** Score comparison between nurse and physician on dimensions before DGS

Item	Nurse (n=75)		Physician (n=32)		t	P
	Mean	SD	Mean	SD		
Dimension 1	24.75±2.28		23.58±2.54		2.474	0.015
Dimension 2	10.72±1.29		11.11±1.25		-1.516	0.132
Dimension 3	10.33±1.27		10.37±1.62		-0.126	0.900
Dimension 4	4.60±1.49		5.92±1.40		-4.543	<0.001

Dimension 1, shared educational and collaborative relationships; Dimension 2, caring as opposed to curing; Dimension 3, nurse's autonomy; Dimension 4, physician's authority.

**Table 4** Score comparison between nurse and physician on dimensions after the DGS

Item	Nurse (n=79)		Physician (n=25)		t	P
	Mean	SD	Mean	SD		
Dimension 1	24.94±2.40		24.44±2.86		0.867	0.388
Dimension 2	10.65±1.53		11.16±1.07		-1.535	0.128
Dimension 3	10.11±1.64		10.52±1.56		-1.105	0.272
Dimension 4	4.99±1.79		6.36±1.29		-3.551	0.001

Dimension 1, shared educational and collaborative relationships; Dimension 2, caring as opposed to curing; Dimension 3, nurse's autonomy; Dimension 4, physician's authority. SD, standard deviation.

professional rank and title, or years of working experience (Table 2).

#### *Attitude comparison on each dimension before and after the DGS towards PNC*

Statistically significant differences were identified between physicians and nurses on dimension 1 and dimension 4 before DGS, whereas the difference was no longer observed

on dimension 1 after DGS (Tables 3,4).

#### **Discussion**

This analysis demonstrates that the DGS boosts the understanding by physicians and nurses of their responsibilities in teamwork. The recognition degree increased after the DGS in our study on dimension 3, with physician and nurse responsibility being greatly overlapped

(Table 1). This is an important finding given that nurses and physicians must be able to rely on each other for optimal patient outcomes. Mutual respect is vital (22), yet physician-nurse disagreements can occur during clinical collaboration due to the differences of s educational backgrounds and work responsibilities, and importantly lack of or suboptimal communication (23). The implementation of DGS in ICU, are extremely important for the whole care team, which can help physicians and nurses focus on important goals and improve documentation of care (24).

A critical patient in an intensive care setting especially requires a clear goal for diagnostic and treatment plans in order to cope with the emergency situation. Since the implementation of the DGS in our emergency setting, the physician-nurse team has been able to convene daily during morning rounds to discuss and set the goal and evaluation target of the working day for each patient. In this way, a centralized and effective care and treatment can begin.

Although the physician and nurse independently work on tasks related to their own duty, the share goal of optimizing treatment effectiveness necessitates close communication concerning patient condition changes, plan or intervention effectiveness, and revision of physician orders. The target set, trace, revision and completion of the DGS facilitates this communication and supervision between the day and night shifts and between the physician and nurse.

Furthermore, the DGS helps lower the interference in physician and nurse interaction due to factors such as age, knowledge base and professional level. Objective bias or disagreement were obviated after the initiation of the DGS, regardless of the age, knowledge and professional factors involved. The collaboration showed a homogeneous attitude between every level of physician and nurse (Table 2); the physician-nurse teams were indeed “on the same page!”

Our tabular daily goal promotes physician and nurse awareness of patient diagnosis and treatment. Being located at bedside, the DGS is highly accessible, which simplifies the interaction of team members. The target goal being clearly expressed during physician or nurse shift changes facilitates the uniformity of patient management between the day and night teams. The DGS also standardizes the workflow of critical care conditions, enabling this by its clear goal and evidence-based improvement records, and by mitigating the effects of opinion bias and communication conflicts.

The DGS also helps enable team members to grow and cooperate. The difference seen on dimension 1 was not noted after DGS implementation, which implies that

the shared educational and collaborative relationships between physicians and nurses improved. As such, the DGS promotes sharing of knowledge and working toward a common goal where each professional learns about each other's roles and responsibilities from each other and helps ensure better communication with fewer chances of error.

The DGS framed a model workflow of the morning rounds, directing physicians and nurses to review every system and highlight those important concerns via the tabular checklist, which included items such as tubes *in situ*, indicator of extubation, rehab, pressure ulcer, DVT, hospital infection control and prevention, delirium, sedation, analgesia and family members' special needs or requirements. The targeted goal also guided junior residents and nurses towards conceiving critical patient management as a systematic enterprise.

Practical advice, suggestions for improvement, and constructive criticism for increasing the effective implementation of the goal through team interactions are fully affirmed and encouraged. This attitude facilitates the building of a positive dynamic between physicians and nurses. In the earlier weeks of the DGS in our emergency settings, some physicians in charge first refused to complete the DGS, citing concerns of a greater workload. Soon after the initiation, those physicians reporting being happy to utilize the DGS, as it made them fully aware of patient conditions, while incorporating into their mind a systemic overview of patient-care, which can improve work efficiency and reduce their overall workload. Overall, these benefits helped achieve the realization that while the DGS was compulsory work, it was compatible and contributed to hospital-wide safety culture. Upon being surveyed, all the nurses were satisfied with the implementation of the DGS when the questionnaire was distributed in April 2017. In fact, the nursing team developed a “your favorite physician” award following the DGS implementation for the physicians whose target goals were most clear and cooperation-oriented.

While this novel study prospectively quantified physician-nurse collaboration, our study only focused on the attitude change with the DGS application concerning the physician-nurse collaboration, and it did not closely examine patient quality indicators or outcomes in emergency care settings. The attitude of PNC is crucial in an EICU department that frequent turnover between intensive care and regular care were observed. We standardized the workflow of critical patients through the implementation of the DGS along with multiple policies

have been documented since its initiation, including fluid management of patients after emergency surgery, heart rate and blood pressure management of patients with dissecting aneurysm, and blood sugar control orders in insulin pump patients. Further investigation assessing how such changes in physician-nurse collaborations impact patient outcomes is warranted.

In conclusion, this study shows the use of a standardized and individualized checklist of the DGS in an emergency intensive care setting can improve cooperation between physicians and nurses along with building rational consideration and positive collaboration in clinical practice.

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The name of the ethics committee is Zhejiang Medical University, Sir Run Run Shaw Hospital. The number/ID of the approval is 2015KYB209.

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