

Postprint Version	1.0
Journal website	http://dx.doi.org/10.1016/j.pec.2008.07.004
Pubmed link	http://www.ncbi.nlm.nih.gov/pubmed/18701233
DOI	10.1016/j.pec.2008.07.004

This is a NIVEL certified Post Print, more info at <http://www.nivel.eu>

Physician – patient communication in single-bedded versus four-bedded hospital rooms

¹IRENE VAN DE GLIND, ²SANDRA VAN DULMEN, ³ANNE GOOSSENSSEN

¹ Irene van de Glind: Institute of Health Policy and Management, Erasmus Medical Center
Postbus 1738, 3000 DR Rotterdam

Telephone number 0031-10 408 1868

Fax number 0031-10 408 90 94

E-mail address i.vandeglind@hubbub.nl

² Sandra van Dulmen: NIVEL (Netherlands Institute for Health Services Research)

³ Anne Goossensen: Institute of Health Policy and Management, Erasmus Medical Center

ABSTRACT

Objective: To examine whether physician-patient communication in multi-bedded rooms differs from communication in single rooms during ward rounds.

Methods: Ward rounds in single bedded patient rooms and ward rounds in four bedded rooms were audiotaped and analyzed with an adapted version of MIARS.

The researcher completed an observational checklist of each encounter. We measured: the duration of speech time, the types of verbal and nonverbal communication, the extent to which patients and physicians raise intimate subjects.

Results: Encounters during ward rounds in single rooms significantly took up more time than encounters in four-bedded rooms. The patients asked more questions and made more remarks in single rooms compared to four-bedded rooms. Empathic reactions of the physician were scored significantly more often in single rooms than in four-bedded rooms. No differences were observed concerning the extent to which intimate subjects were brought up.

Conclusion: This study is the first that investigated this subject. Findings suggest that single rooms contribute positively to physician-patient communication.

Practice Implications: The research findings indicate the relevance of taking account of the context in which physician-patient communication takes place.

1. INTRODUCTION

Hospital architecture and design is changing from functional, unified and standardized hospital buildings into 'healing environments'. A 'healing environment' is based on

designing an environment that has therapeutic effects on patients [1-6]. One rather new aspect of hospital architecture and design is the shift from multibedded patient rooms to single patient rooms, which is seen as an ultimate condition of a therapeutic environment for both patients and staff [4, 7, 8]. Although the effects of single rooms have not been studied systematically yet, ever still more hospitals choose to build single rooms [9]. Some authors have mentioned that they expect that single rooms have significance for physician-patient communication [1, 3, 10, 11]. In view of the importance of good bedside communication the introduction of single rooms raises the question: What do single patient rooms mean for the physician-patient communication on the hospital ward?

Physician-patient communication on a nursing ward generally takes place at the bedside of the patient, traditionally located in a multi-bedded hospital room. An evident question is if the presence of other patients affects the communicative behaviour of physicians and patients. Ong et al [12] have pointed out that "Little attention has been devoted to privacy, which can be considered as a relevant aspect of the doctor-patient dyad." According to Ong et al, physical privacy concerns the extent to which a patient is physically accessible to others. When patients share their room during hospitalization they have little privacy: one can overhear conversations and even see parts of each others body.

Despite the fact that several authors raise this subject, little research has been conducted on privacy and quality of communication during ward rounds. Vincent's study suggests that, compared to paper visits, bedside visits do have benefits for the patient [13]. Patients seem better informed and educated, experience more comfort, feel more encouraged and consider their physician more interested in the illness and the person and not just the disease. They also report less frequently that something is being hidden from them [13]. Another study found that physicians often ignore patients' feelings and concerns during bedside visits: in 53% of all bedside communication during ward rounds patients expressed emotional 'clues' but physicians responded adequately to these clues in only 38% of the cases [14].

It has been claimed that communication research should broaden its context [15]. With this study, we introduce a new viewpoint in communication-research by investigating physician-patient communication within the context of place and space. The aim is to examine whether physician-patient communication in multi-bedded rooms differs from communication in single rooms during ward rounds. We expect that communication in a single room takes more time, in terms of patient speech-time and the total duration of patient and physician talk. We also expect that physicians display more affective behaviour in single rooms and that both physician and patient ask more questions about intimate subjects in single rooms.

2. METHODS

2.1 Procedures and sample

The urological hospital ward of the Erasmus Medical Centre in Rotterdam was rebuilt into ten single patient rooms on one side and four traditional four-bedded patient rooms on the other side of the ward. Patients and physicians were invited to participate in the study between December 2006 and May 2007. Informed consent was asked at the patients' bedside, one day prior to the ward round. The aim of the study was concealed for the physicians and the patients. The encounters during the morning ward rounds were audiotaped. In addition, the researcher accompanied the physician during the ward rounds and completed an observational checklist of each encounter. Patients were allocated to a single patient room by randomization to control for case-mix differences.

2.2 Measures

For the purpose of this study the following aspects were measured:

- The duration of patient and physician speech time during ward rounds
- The types of verbal and nonverbal communication of both physician and patient

- The extent to which patients and physicians raise intimate subjects

Speech time reflects the patient's active participation in the conversation. We measured differences for patients and physicians and controlled for the duration of the encounter. With respect to duration, first the total duration of the encounter was measured. Second the relative speech time of both physician and patient was calculated, indicating their respective conversational participation.

2.2.1 Verbal communication

Verbal communication was rated using an adapted version of the MIARS (Medical Interview Aural Rating Scale) [16, 17]. MIARS rates patient-expressed emotional cues only and distinguishes between subsequent adequate and non-adequate responses by the physician. For the purpose of the study we also coded the questions patients asked as a way of measuring information cues. First, patient cues on information seeking were coded and classified in medical, practical or lifestyle information. Then, patient's emotional cues were coded on 4 levels: Level 0 concerns neutral cues, as it contains no element of feeling. Level 1 refers to concerns like hints of emotion, in which element of feeling is mentioned implicitly. Level 2 are cues in which a feeling is mentioned clearly. At last, level 3 cues apply to the expression of emotion, and is the deepest level of feeling [16].

In addition, MIARS distinguishes several categories in which physician responses can be classified: exploration, acknowledgement (checking, reflection or empathy), factual clarification, distancing strategies and overt blocking. The last two categories are qualified as inadequate. Furthermore, verbal communication of the physician is coded in terms of skills. The grammatical form or function of the question or statement is rated as a count, classified in open questions, screening questions, negotiation and summary [16].

2.2.2 Nonverbal communication

Nonverbal communication was assessed by rating global affect measures and patient centeredness on a 5-point scale [18-21]. The measures of patientcenteredness include:

- The extent to which the physician allows the patient to use his/her own words;
- The extent to which the patient participates in decisions;
- The extent to which the physician is receptive to the patient

Regarding global affect the following items were rated on a 5-point scale:

- The extent to which the physician is/looks nonverbally concerned;
- The extent to which the physician patronizes the patient (e.g. using diminutives);
- The extent to which the patient looks nervous.

2.2.3 Intimate subjects

This study took place on a Urological hospital ward. This means that many conversations inevitably concern physically intimate subjects. The question then is when to rate a subject as intimate and when as medical in nature. We choose to count every subject brought up about sexuality, emotional consequences of surgery, genitals or urine incontinence. The audio taped encounters were analyzed on number of intimate subjects, and it was also scored who brought up the intimate subject.

2.3 Statistical analysis

Data was first analyzed descriptively and second the physician-patient communication during encounters in single patient rooms were compared to those in four-bedded rooms. *t*-Tests were carried out to test for differences in encounters between single patient rooms and four-bedded patient rooms.

3. RESULTS

Fifty-two encounters during 12 different ward rounds were observed and audiotaped; 21 encounters in single rooms and 31 encounters in four-bedded rooms. The average length of stay on this hospital ward is seven days, consequently ward rounds could be observed only once a week to include new patients. In the end we only obtained a substantial number of encounters of one physician due to shifting jobs by 2 other physicians. We chose to only analyze the encounters of that one physician, because of the need to control for inter-doctor variation between the physicians. The physician (female, age 26) was working as a physician-assistant for 2,5 years; of which half a year in Erasmus Medical Centre. From this single physician 32 encounters were obtained: 11 encounters in single rooms and 20 encounters in four-bedded rooms.

Of these 32 encounters the patient characteristics were as follows. 23 patients were men and 9 were women, reflecting a standard urology patient sample. The mean age was 62.8 years (sd = 14.3). Dutch was the native tongue in 27 patients. Furthermore the mean length of stay of the patients included, on the moment of observation, was 7.47 days (sd = 8.3 days).

[TABLE 1]

3.1 Duration of talk and relative speech time

In a single patient room the mean duration of the physician-patient encounter was 4.6 minutes (sd = 1.9). The mean duration of the encounter in a four-bedded room was 2.6 minutes (sd = 1.4). The difference reached significance ($t(3.197)$; $p=.003$).

The patients talked on average 26% of the total time of the encounter in a single room, while in four-bedded rooms this was 23%. In both single and four-bedded rooms the physician spoke 42% of the time. The remaining 32% (single rooms) and 35% (four-bedded rooms) of the time was spent on other activities like examining a wound or completing a patient file or remaining silent. No significant differences were found on any of these measures.

[TABLE 2]

3.2 Patient cues

The patients in single rooms disclosed on average five emotional cues (sd = 2.4) per encounter, most on Level 0, i.e. without reference to feelings. Patients in four-bedded rooms disclosed a mean of 3.14 (sd = 2.2) emotional cues per encounter. This difference in number of cues appeared to be significant ($t(2.213)$; $p=.035$). No significant differences in disclosure were found on the separate emotional levels indicating that the patients in single rooms did not disclose more cues of a deeper emotional level than those in four-bedded rooms. The mean number of information cues was 2.27 (sd = 3.2) and 0.62 (sd = 0.7) in single and four-bedded rooms, respectively. Broken down by content, it appeared that only information cues with a medical focus were expressed more often in single rooms ($t(2.806)$; $p=.009$).

In short, patients in single rooms disclosed more information cues as well as emotional cues. Patients and physicians relatively spoke the same proportion of the total duration of the encounter.

3.3 Physician responses

The physician expressed on average 6.2 responses (sd = 4.5) to the patient cues in single patient rooms and 3.3 responses in four-bedded rooms (sd = 2.7). This difference is significant ($t(2.265)$; $p=.031$). The physician expressed more responses in single rooms compared to four-bedded rooms. Most physician responses were rated as being adequate.

The mean number of times the physician blocked a patient cue by shifting topic was 0.25; and this was 0.19 times per encounter by ignoring the patient cue. 10.2% of all physician responses to a patient's cue appeared to be inadequate. No differences were found between responses in single and four-bedded rooms.

The physician mostly responded explorative to a cue by asking a question. The mean number was 1.72 exploring responses on a total of 4.28 (sd = 3.6). In single rooms the physician responded more often in an empathic way than in four-bedded rooms ($t(0.252)$ $p=.031$). The physician uttered 0.82 times per encounter a verbal empathic response on a patient's cue in a single room (sd = 0.8) versus 0.29 times per encounter in a four-bedded room (sd = 0.6). After calculating the proportion of empathic responses, it appeared that on single rooms 13% of the responses were empathic against 9% in four-bedded rooms. Other categories of physician responses showed no significant differences between single rooms and four-bedded rooms.

Also, no differences were found in the physician's use of open questions, in negotiation and in psychological exploration (Table 2).

3.4 Non-verbal communication

The total score on patient-centeredness was not higher in single patient rooms than in four-bedded rooms (Table 2). On item level, the extent to which the patient participates in decisions showed a significant difference ($t(0.252)$; $p=0.010$) in favour of single rooms. Also the extent to which the physician is nonverbally concerned was higher in single rooms ($t(2.099)$; $p=.044$).

In addition, patients in single rooms significantly showed more nervousness during ward rounds than patients in four bedded rooms ($t(2.182)$; $p=.037$). No difference was found in the total score on global affection.

3.5 Intimate subjects

Hardly any intimate subjects were discussed during the ward rounds studied. No differences were found in the frequency or in the content of the intimate talk in single versus four-bedded rooms. In most encounters no intimate subject was brought up at all. Two subjects that were discussed were for instance urinary incontinence in the case of a female patient, and the way a male patient experienced catheterisation.

4. DISCUSSION AND CONCLUSION

4.1 Discussion

The aim of this study was to establish whether the physician-patient communication during hospital ward rounds differs between multi-bedded rooms and single rooms. Similar research has hardly been done before.

We found in this explorative study that encounters during ward rounds took up more time than encounters in four-bedded rooms. The patients asked more questions and made more remarks in single rooms compared to four-bedded rooms. Furthermore empathic reactions of the physician were scored significantly more often in single rooms than in four-bedded rooms. No differences were observed concerning the extent to which intimate subjects were brought up.

The fact that patients in single rooms appeared to express more medical information cues and more emotional cues in single rooms may explain why encounters in single rooms took more time than encounters in four-bedded rooms. However, the proportion of each participant's speech time was equal for single rooms and fourbedded

rooms. This might be explained by the physician responding to a patient cue in both types of patient rooms. Regarding the finding that patients show more nervousness in single rooms we hypothesize the following. Because patients in single rooms expose themselves more, indicated by the number of information cues and emotional cues patients disclosed, they

show more nervousness. But patients' nervousness could also be explained by higher participation of the patient in decisions in single rooms.

In addition the physician expressed more responses in single rooms. These responses were more often empathically. Nonverbally, the physician looked more concerned in single rooms.

According to Roter and Hall the length of a medical visit holds significance for the nature of the medical discourse [22]. Short visits are associated with less problem identification, fewer preventive actions undertaken and less lifestyle or psychosocial discussion. Nevertheless many studies have reported inconsistent or weak associations between length of visit and quality of care delivered [22]. In this study it was found that the length of bedside visits was shorter in four-bedded rooms compared to single bedded rooms. This is an indication that information giving, discussing and problem identification may be better in single rooms. All the more because patients in single rooms asked more questions and made more remarks.

Single patient rooms may therefore contribute to physician-patient communication in a positive way.

This is especially important for communication during ward rounds. An encounter during ward rounds usually lasts no longer than 10 minutes, while patients are 24 hours a day in their patient room. Roter and Hall argue that patients see very little of their physicians in the hospital at all. Consequently, bedside rounds provide an opportunity to patients to talk to a physician. Single rooms may facilitate the patient to make the most out of these 10 minutes.

However, we are cautious about the significant results of differences of the verbal communication in single rooms and four bedded rooms as standard deviations were rather high, indicating that the data is susceptible to fluctuation as a result of the small number of audiotaped visits. Furthermore this study indicates that hospital architecture, in terms of staying in a single room or in a four-bedded room, affected the communicative behaviour of patients as well as the physician. However, the results of the study should be taken in the caution because we do not know several patient characteristics. Possible co-founders are for example: socio-economic status and education level. Also length of stay and type of surgery are relevant characteristics to take into account. These characteristics could have disturbed the results. For example Roter and Hall pointed out the relevance of education level on doctor-patient communication [22]. Furthermore in this study only a single physician could be included. Notwithstanding these limitations this study showed promising results to facilitate physician-patient communication during ward rounds. Although we investigated only a small sample, we were able to find some large statistically significant results that all point into the same direction. This should be regarded as encouragement to further investigate physician-patient communication on a nursing ward to build the body of knowledge on this subject. In addition, in future studies the preference of the patient should be assessed as well.

4.2 Conclusion

This study is the first that investigated differences in physician-patient communication in single rooms compared to four-bedded rooms. The results demonstrate that single rooms seem to contribute to physician-patient communication in a positive way. The encounters during ward rounds in single rooms lasted longer, patients asked more questions and they made more remarks in single rooms compared to four-bedded rooms. Furthermore affective reactions of the physician were scored more often in single rooms. Consequently, single rooms seem to facilitate both patients and physicians in communication. Continuing this line of argument single rooms could positively affect patient's understanding of health and the care process. While this explorative research has limitations concerning sample size, the findings of this study could be considered as an encouragement to further investigate the influence of place and space on physician-patient communication. In addition to this, consequences of single rooms on several patient outcomes, staff outcomes, on management

of care and on processes of care need to be examined. Given the positive effects on different outcomes measured so far, the quality of patient care is likely to improve by attending to hospital design and construction.

4.3 Practice Implications

This study provides insight in physician-patient communication during hospital ward rounds in single patient rooms. Physician-patient communication at the hospital bedside of the patient has hardly been studied in the context of place and space.

Investigating this subject is a starting-point to understand and to optimize physicianpatient communication during hospitalization and explore the conditions in which good physician-patient communication can take place. Little research has been done on the specific subject of single-bedded rooms as well. Useful information is provided to those involved in policy making on hospital design and construction, because they can use these results to design or renovate hospital wards. The results of this study implicate, on the one hand, that in future hospitals one should only built single patient rooms. This is because of the assumed positive effects on communication, patient satisfaction and in the end on health. On the other hand bedside communication in single rooms may result in increased staff/patient ratios and increased time spent per patient. In terms of financial management, providing single patient rooms may not result in more efficiency due to increased staff/patient ratios. Altogether single rooms do not only affect communication. More research is needed to understand effects of single rooms on other domains. We suggest to investigate for instance recovery-rates, patient safety, patient satisfaction, staff satisfaction and staff/patient ratios in relation to patient housing. Drawing conclusions about the benefits and risks for patients and hospitals regarding single rooms entails making trade-offs.

TABLES

Table 1
Demographic details of the sample

Gender	
Male	23
Female	9
Ethnicity	
Dutch	27
Other	5
Age	
20-39	3
40-54	4
55-59	5
≥ 60	18
Length of stay (mean number of days)	7.47 (sd = 8.3)

Table 2 *
Overview Results: Mean (sd), P

	single rooms (N=11) M (sd)	four-bedded rooms (N=21) M (sd)	P
Duration of the visit/talk (in minutes)			
Total duration of the visit	4.6 (1.9)	2.6 (1.4)	<u>.003</u>
Relative speech time patient	1.3 (1.3)	0.6 (0.5)	<u>.744</u>
Relative speech time physician	1.9 (0.85)	1.1 (0.6)	<u>.513</u>
Verbal communication			
• Information cues patient	2.3 (3.2)	0.6 (0.7)	<u>.123</u>
Medical information	1.8 (2.6)	0.2 (0.4)	<u>.031</u>
Practical information	0.5 (0.7)	0.4 (0.7)	<u>.069</u>
Lifestyle information	0.0 (0.0)	0.0 (0.0)	<u>.924</u>
• Emotional cues patient	5.0 (2.4)	3.1 (2.2)	<u>.035</u>
Level 0	3.4 (1.4)	2.2 (1.9)	<u>.085</u>
Level 1	1.5 (1.6)	0.8 (0.8)	<u>.225</u>
Level 2	0.1 (0.3)	0.1 (0.3)	<u>.970</u>
Level 3	0.1 (0.3)	0.1 (0.2)	<u>.644</u>
• Physician's response	6.2 (4.5)	3.3 (2.7)	<u>.031</u>
Exploration	2.7 (2.4)	1.2 (1.4)	<u>.068</u>
Acknowledgement/empathy	0.8 (0.8)	0.3 (0.6)	<u>.031</u>
Factual clarification	0.5 (0.7)	0.2 (0.5)	<u>.228</u>
Distancing strategies	0.4 (0.7)	0.2 (0.4)	<u>.478</u>
Overt blocking	0.2 (0.4)	0.2 (0.5)	<u>.962</u>
• Communicative skills physicians			
Open-ended questions	1.3 (0.8)	1.7 (1.5)	<u>.368</u>
Screening questions	3.7 (2.5)	2.3 (1.4)	<u>.043</u>
Negotiation	1.3 (1.3)	0.7 (0.7)	<u>.184</u>
Summary	0.2 (0.4)	0.1 (0.4)	<u>.791</u>
Non-verbal communication			
• Patient-centeredness	3.61 (0.99)	2.97 (0.87)	<u>.085</u>
Patient uses own words	3.00 (1.18)	2.90 (1.04)	<u>.816</u>
Participation in decisions	3.82 (1.33)	2.62 (1.07)	<u>.010</u>
Receptiveness of physician	4.00 (0.78)	3.38 (1.02)	<u>.090</u>
• Affection			
Physician is nonverbally concerned	4.55 (1.04)	3.86 (0.79)	<u>.044</u>
Patronizing behaviour physician	1.64 (0.81)	1.95 (0.92)	<u>.345</u>
Patient's nervousness	2.64 (1.03)	1.90 (0.83)	<u>.037</u>
Intimate subjects	0.27 (0.65)	0.48 (0.87)	<u>.502</u>

* t-Tests were carried out to test for differences

REFERENCES

1. Altimier, L.B., *Healing Environments: For Patients and Providers*. Newborn and Infant Nursing Reviews, 2004. 4(2): p. 89-92.
2. Ulrich, R.S., *View through a window may influence recovery from surgery*. Science, 1984. 224(4647): p. 420-1.
3. Ulrich, R.S., et al., *The Role of the Physical Environment in the Hospital of the 21st Century*. 2004, Report sponsored by The Robert Wood Johnson Foundation and The Center for Health Design.
4. Bobrow, M. and J. Thomas, *Inpatient Care Facilities*, in *Building Type Basics for Healthcare Facilities*, R.L. Kobus, Editor. 2000, John Wiley & Sons, inc.: New York. p. 131 - 193.

5. Chaudhury, H., A. Mahmood, and M. Valente, Advantages and disadvantages of single - versus multiple-occupancy rooms in acute care environments. *Environment and Behavior*, 2005. 37(6): p. 760-786.
6. Schweitzer, M., L. Gilpin, and S. Frampton, Healing spaces: elements of environmental design that make an impact on health. *J Altern Complement Med*, 2004. 10 Suppl 1: p. S71-83.
7. Frampton, S.B., L. Gilpin, and P. Charmel, *Putting Patients First*. 2003, San Fransisco: Jossey-Bass. 350 p.
8. Hamilton, D.K. Design for patient units. in *Healing by Design: Building for Health Care in the 21st Century*. 2000. Montreal.
9. van de Glind, I., S. de Roode, and A. Goossensen, Do patients in hospitals benefit from single rooms? A literature review. *Health Policy*, 2007. 84(2-3): p. 153-161.
10. Tyson, G.A., G. Lambert, and L. Beattie, The impact of ward design on the behaviour, occupational satisfaction and well-being of psychiatric nurses. *Int J Ment Health Nurs*, 2002. 11(2): p. 94-102.
11. Cortvriend, P., The effect of the healthcare environment on patients and staff. 2005, European School of Oncology (ESO) & European Health Management Association (EHMA): Manchester.
12. Ong, L.M., et al., Doctor-patient communication: a review of the literature. *Soc Sci Med*, 1995. 40(7): p. 903-18.
13. Vincent, J.L., Communication in the ICU. *Intensive Care Med*, 1997. 23(10): p. 1093-8.
14. Levinson, W., R. Gorawara-Bhat, and J. Lamb, A study of patient clues and physician responses in primary care and surgical settings. *J Amer Med soc*, 2000. 284(8): p. 1021-7.
15. Bensing, J., S. van Dulmen, and K. Tates, Communication in context: new directions in communication research. *Patient Educ Couns*, 2003. 50(1): p. 27-32.
16. Heaven, C. and C. Green, Medical Interview Aural Rating Scale. Overview of Rating Scheme. 2001, CRC Psychological Medicine Group.
17. Heaven, C., P. Maguire, and C. Green, A patient-centred approach to defining and assessing interviewing competency. *Epidemiol Psychiatr Soc*, 2003. 12(2): p. 86-91.
18. Roter, D., The enduring and evolving nature of the patient-physician relationship. *Patient Educ Couns*, 2000. 39(1): p. 5-15.
19. Bensing, J.M., et al., Shifts in doctor-patient communication between 1986 and 2002: a study of videotaped general practice consultations with hypertension patients. *BMC Fam Pract*, 2006. 7: p. 62.
20. van den Brink-Muinen, A. and W. Caris-Verhallen, Doctors' responses to patients' concerns: testing the use of sequential analysis. *Epidemiol Psychiatr Soc*, 2003. 12(2): p. 92-7.
21. van den Brink-Muinen, A., et al., Has patients' involvement in the decisionmaking process changed over time? *Health Expect*, 2006. 9(4): p. 333-42.
22. Roter, D.L. and J.A. Hall, *Doctors talking with patients, patients talking with doctors*. 1992, Westport: Auburn House.