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# Availability of Psychiatric Consultation-liaison Services as an Integral Component of Palliative Care Programs at Japanese Cancer Hospitals

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**Objective:** Collaboration between psychiatry and palliative medicine has the potential to enhance the quality of medical practice. The integration between palliative care and psychiatry has been attempted only in discrete medical settings and is not yet firmly established as an institution. Our objective was to determine the availability and degree of integration between psychiatric consultation-liaison services and palliative care in Japan.
**Methods:** A survey questionnaire was mailed to consultation-liaison psychiatrists at 375 government-designated cancer hospitals regarding their consultation-liaison services.
**Results:** A total of 375 survey questionnaires were sent to consultation-liaison psychiatrists, with a response rate of 64.8%. Designated cancer hospitals with approved palliative care teams were significantly more likely to have a consultation-liaison psychiatrist in the palliative care team than those in non-approved palliative care teams [80/80 (100%) versus 110/153 (73%); $P = 0.008$]. Approved palliative care teams had double the number of referrals, conducted rounds more frequently and held conferences more frequently. Psychiatrists of the approved palliative care teams spent more of their time on palliative care consultations, adhered more closely to consultation processes and contributed more actively to the integration of developmental perspectives in treatment plans.
**Conclusions:** In Japan, most designated cancer hospitals with approved palliative care teams were more likely to integrate psychiatric consultation-liaison services into their palliative care programs. Systematic strategies for integration between palliative care and consultation-liaison psychiatry would contribute to the provision of appropriate psychosocial care for cancer patients and families at all stages.

*Key words: psycho-oncology – palliative care team – consultation-liaison psychiatry – cancer – palliative medicine*

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## INTRODUCTION

Although remarkable progress has been made in cancer treatment, most patients with advanced cancer eventually face complex physical, psychiatric and social problems related to their disease, treatment or comorbidities (1,2). It is strongly recommended that palliative care services should be provided earlier in the cancer trajectory (3,4). General services provided by hospitals cannot always manage these problems effectively. Many international organizations support early incorporation of palliative care in oncology practice (4,5) and hospital-based palliative care programs have rapidly expanded over the past decade (6,7). Palliative care teams now play a key role in the management of symptoms, psychosocial support, assistance with decision-making and care coordination across providers (7–12).

Research shows that psychological distress in the form of depression and other mental health problems is associated with increased morbidity and mortality and decreased functional status (13,14). Approximately 29–43% of patients with cancer (all types, all stages) fulfill the diagnostic criteria for psychiatric disorder (14,15). A number of studies have suggested that psychosocial care services contribute to improving patients' quality of life (16–20). However, cancer patients report that many health-care providers still do not consider psychosocial support as an integral component of quality cancer care and may fail to recognize, adequately treat or provide a referral to the required services for depression and distress in cancer patients (9,21,22). The reasons for under-recognition are the failure of clinicians to inquire about psychosocial problems because of inadequate education and training (including inadequate clinical practice guidelines) in these issues, a lack of awareness of available services to address these needs (23) or a lack of knowledge about how to integrate the attention to psychosocial health needs into their practice (15). The program which could address cross-system problems and coordinate benefits is needed.

One of the solutions for poor coordination is to improve networking and collaboration between systems; integration between psychiatry and palliative care programs.

Integration is defined as the search to connect the health-care system with other service systems in order to improve outcomes (24).

Integration is classified into three different levels: linkage, coordination and full integration. First, 'linkage' promotes the relationships between systems that serve the whole populations without having to rely on outside systems for special relationships. Linkage begins with screening to identify emergent needs. When more serious conditions are identified, health professionals know where it is appropriate in other systems to send people and how to ensure that they get there. Second, coordination requires structures and managers to coordinate benefits and care across systems. Coordination is more structured than linkage, but systems are operated independently of one another. Third, full integration creates new programs where resources from multiple systems are pooled. The fully integrated system gets control over several resources to define new benefits directly.

There are a number of barriers to collaboration between psychiatry and palliative care program, such as the misinterpretation that psychiatry is excessively medicalized, that psychiatric treatment is too difficult to practice in daily oncological settings and that patients refuse referral for psychiatric treatment (25–27). The previous survey noted that 45% of hospices in the UK have no access to psychological and psychiatric services and also revealed a large discrepancy in provision compared with the recommendations made in recent guidelines (28). The linkage between palliative care and psychiatry has been attempted only in discrete medical settings and is not yet firmly established as an institution.

Given the substantial prevalence rates and the management challenges presented by many of the patients, collaboration between psychiatry and palliative medicine has the potential to enhance the quality of medical practice, education and research. One of the solutions for promoting integration between the two fields in practice is to promote a full integrated care model, which involves with resources directly.

In Japan, the Cancer Control Act was approved in 2006, and prefectural and local cancer hospitals were designated by the government (29). The designated cancer hospitals were required to provide a hospital-based palliative care team, with a palliative care specialist, a consultation-liaison psychiatrist and a certified advanced nurse practitioner as core members.

In addition, national medical insurance covers the services provided by qualified palliative care teams that fulfill the necessary conditions: palliative care teams must be interdisciplinary teams composed of full-time core members with a palliative care specialist, a consultation-liaison psychiatrist, a certified advanced nurse practitioner and hospital pharmacists. The approval of palliative care teams by the insurance plan encourages the dissemination of palliative care service in practice (11).

To date, there have been few reports on the activities of consultation-liaison psychiatrists on palliative care teams. The current state of availability of psychiatric consultation-liaison services in palliative care settings and the degree of integration between psychiatry and palliative care services are not known. Many cancer hospitals state that they provide psychosocial support with palliative care; however, the structure, processes and outcomes of their support programs remain unclear. The purpose of our survey was to determine the availability and the degree of integration of psychiatric consultation-liaison services and palliative care programs in Japanese designated cancer hospitals. In addition, a comparison was made between the cancer hospitals with approved palliative care teams and those with non-approved palliative care teams.

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## PATIENTS AND METHODS

### Contents of Survey

Survey questions were drawn up after a review of pertinent literature. A panel of experts including consultation-liaison psychiatrists, psychosomatic physicians, psychologists, nurses and palliative care specialists reviewed and revised the survey before distribution (4,19,30,31). Survey questions were generated based on the tripartite division of quality assessment and monitoring: structure, processes and outcomes to evaluate the clinical aspects of consultation-liaison psychiatry in palliative medicine (32). The questionnaire consisted of multiple-choice, Likert-scale and fill-in questions.

The questionnaire focused on six areas, which included hospital characteristics, professional backgrounds, clinical activities, availabilities, processes of practice and educational activities. Specific attention was paid to consultation processes: assessing physical and psychosocial symptoms, assessing decision-making capacities, assisting with decision-making regarding treatment, establishing the goals of care, interacting frequently with physicians and staff, coordinating care across providers and providing appropriate follow-up.

### Subjects

#### *Cancer Hospitals*

The designated cancer hospitals in Japan were identified from the database of the Center for Cancer Control and Information Services at the National Cancer Center and the list published by the Office for Cancer Control, Health Services Bureau, Ministry of Health, Labour and Welfare.

We obtained a list of 375 government-designated cancer hospitals, which provide services to ~25% of the cancer patients in Japan. At 90 of the designated cancer hospitals, the palliative care teams were approved for national medical insurance. We surveyed all government-designated cancer hospitals.

We identified the consultation-liaison psychiatrists (in some centers, psychosomatic physicians on behalf of psychiatrists) of 375 government-designated cancer hospitals from the database of the Center for Cancer Control and Information Services at the National Cancer Center and verified those who were core members of the palliative care teams through personal telephone contact with the cancer care support center of each institution.

#### *Survey Process*

Survey questionnaires were sent to the 375 government-designated cancer hospitals, asking the team psychiatrists and psychosomatic physicians about their programs and clinical activities. The initial invitation was included with the mail survey. Recipients were given 6 weeks to complete the questionnaire anonymously and return it by mail. A reminder letter was sent to non-respondents at 6 and 12 weeks. Data collection was performed between November 2009 and February 2010.

### Statistical Analysis

We summarized the availability and the characteristics of psychiatric consultation-liaison services involved with the palliative care teams by using standard descriptive statistics, including medians, interquartile ranges (IQRs), proportions and frequencies, together with 95% confidence intervals where appropriate. Differences in services provided between the approved and non-approved palliative care teams were evaluated using Fisher exact tests for categorical variables. The Mann–Whitney test was used for non-parametric continuous variables. $P < 0.05$ was considered statistically significant. SPSS version 17.0 software (SPSS Inc., Chicago, IL) was used for statistical analyses.

## RESULTS

Of the 375 questionnaires that were mailed, 243 were returned (response rate = 64.8%). Of these, 10 were excluded due to missing data for the primary end points. Thus, 233 responses were finally analyzed (effective response rate = 62.1%). Psychiatrists and psychosomatic physicians of the approved palliative care teams were more likely to respond compared with those of the non-approved palliative care teams (88.8 versus 53.7%).

### Characteristics of Consultation-liaison Psychiatrists and Psychosomatic Physicians at Designated Cancer Hospitals

Table 1 shows the background characteristics of consultation-liaison psychiatrists and psychosomatic physicians, infrastructure for psychiatry and palliative care, and structure of palliative care teams at designated cancer hospitals. The years of clinical experience of psychiatrists at cancer hospitals with approved palliative care teams was shorter than those with non-approved palliative care teams [16.3 versus 18.8 (years); $P < 0.02$]. On the other hand, the rate of psychiatrists of approved palliative care teams taken part in the government-certified palliative care workshop was higher than that of non-approved palliative care teams (90 versus 77%; $P < 0.02$).

Compared with the cancer hospitals with non-approved palliative care teams, those with approved palliative care teams were significantly more likely to have full-time psychiatrists and psychiatric outpatient services. All cancer hospitals with approved palliative care teams involved psychiatric consultation-liaison services. On the other hand, the rate of integration of services was only 73% at cancer hospitals with non-approved palliative care teams.

The number of inpatient beds was higher at cancer hospitals with approved palliative care teams compared with those

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Table 1. Characteristics of consultation-liaison psychiatrists and psychosomatic physicians at designated cancer hospitals

| | Cancer hospitals with approved palliative care teams ($n = 80$) | Cancer hospitals with non-approved palliative care teams ($n = 153$) | *P*-value |
|---|---|---|---|
| Professional background of psychiatrists and psychosomatic physicians on palliative care team | | | |
| Clinical experience (years) | 16.3 (±6.9) | 18.8 (±8.0) | 0.02 |
| Clinical experience in cancer care (years) | 7.9 (±6.8) | 7.0 (±6.5) | 0.33 |
| Registration of government-certified palliative care workshop, *n* (%) | 72 (90%) | 117 (77%) | 0.02 |
| Psychiatrist on palliative care team, *n* (%) | | | |
| Involvement of psychiatric consultation service in palliative care team | 80 (100) | 110 (73) | <0.001 |
| Full time | 19 (24) | 11 (7) | |
| ≥50% of protected time | 30 (38) | 22 (14) | |
| Hospital, *n* (%) | | | |
| Cancer center | 8 (10 | 20 (13) | 0.49 |
| University hospital | 32 (40) | 21 (14) | 0.002 |
| Number of inpatients beds | 702 | 590 | <0.001 |
| Number of inpatients with cancer in 2007 | 3723 | 2573 | <0.001 |
| Inpatients with cancer (%) in 2008 | 30.1 | 24.7 | 0.043 |
| Infrastructure of hospital, *n* (%) | | | |
| Palliative care units, institution-operated hospice | 16 (20) | 33 (22) | 0.87 |
| Psychiatric ward | 44 (55) | 54 (35) | 0.005 |
| Outpatient clinic | 71 (89) | 109 (71) | 0.003 |
| Consultation-liaison service | 76 (95) | 134 (88) | 0.10 |
| Psychiatrists, median | 4 | 1 | <0.001 |
| >5 | 35 (44) | 30 (20) | |
| 2–4 | 23 (29) | 43 (28) | |
| 1 | 19 (24) | 34 (22) | |
| Palliative care team | | | |
| Palliative care physician | | | |
| Full-time equivalent positions, median (IQR) | 1 (1–3) | 1 (0–2) | 0.008 |
| Physicians with ≥50% of protected time, median | 2 | 2 | 0.23 |
| Nurses | 1 | 1 | 0.83 |
| Pharmacists, median | 1 | 1 | 0.65 |

with non-approved palliative care teams. Psychiatric consultation-liaison services and psychiatric outpatient clinics were common in both cancer hospitals with approved palliative care teams and those with non-approved palliative care teams. Only 20% of cancer hospitals offered palliative care units or institution-operated hospices.

### Involvement of Psychiatric Consultation-liaison Services in Palliative Care Programs

Table 2 provides an overview of the involvement of psychiatric consultation-liaison services in palliative care teams. Compared with the cancer hospitals with non-approved palliative care teams, the approved palliative care teams provided twice as many referrals (25 versus 12; $P < 0.001$), conducted rounds with all team members more frequently and held conferences more frequently. Similarly, psychiatrists of approved palliative care teams participated in team rounds and conferences more frequently. On the other hand, only half the consultation-liaison psychiatrists typically attended the rounds of the palliative care teams.

### Availability of Psychiatric Services in Palliative Care Programs

Table 3 provides information about the structure and processes of psychiatric consultation-liaison services in palliative care programs. Psychiatric consultation-liaison services

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Table 2. Involvement of psychiatric consultation-liaison services in palliative care programs

| | Cancer hospitals with approved palliative care teams ($n = 80$) | Cancer hospitals with non-approved palliative care teams ($n = 153$) | *P*-value |
|---|---|---|---|
| Palliative care consultation services | | | |
| Availability days per week median (IQR) | 5 (3–5) | 3 (1–5) | <0.001 |
| Number of referrals (per 2 months) | 25 | 12 | <0.001 |
| Frequency of rounds with all team members, *n* (%) | | | |
| >1/week | 33 (41) | 35 (23) | 0.001 |
| 1/week | 42 (53) | 88 (59) | |
| 1–3/month | 0 (0) | 2 (1) | |
| None | 5 (6) | 13 (9) | |
| Frequency of conferences with all team members, *n* (%) | | | |
| >1/week | 13 (16) | 11 (7) | 0.008 |
| 1/week | 60 (75) | 109 (73) | |
| 1–3/month | 2 (3) | 22 (15) | |
| None | 5 (6) | 5 (3) | |
| Contributions to palliative care team, *n* (%) | | | |
| Participating in team rounds | | | |
| ≥80% | 42 (53) | 62 (41) | 0.003 |
| ≥40 and <80% | 21 (26) | 26 (17) | |
| <40% | 17 (21) | 64 (42) | |
| Participating in team conferences | | | |
| ≥80% | 61 (76) | 97 (63) | 0.02 |
| ≥40 and <80% | 7 (9) | 27 (18) | |
| <40% | 12 (15) | 28 (18) | |

involved with palliative care teams provided not only inpatient consultations, but also outpatient clinics and family support. Generally, psychiatrists of approved palliative care teams served more patients, followed up more frequently and responded more readily to referrals compared with psychiatrists on non-approved palliative care teams.

Regarding the total time spent for consultations and follow-up, psychiatrists at cancer hospitals with approved palliative care teams committed more of their time to palliative care consultations compared with psychiatrists at cancer hospitals with non-approved palliative care teams. However, the time devoted to palliative care consultations remained at about 12 h/week at cancer hospitals with approved palliative care teams, which had full-time psychiatrists as core members.

### Attitudes and Practices of Psychiatrists

Table 4 reveals information about the practice of consultation-liaison psychiatric services involved with palliative care teams provided by consultation-liaison psychiatrists. Table 4 shows the number of hospitals where psychiatric consultation-liaison services adhered to the consultation practices. In both cancer hospitals with approved palliative care teams and those with non-approved palliative care teams, the adherence rates are various by subjects. The adherence rate was high in assessing psychiatric symptoms directly (99% in cancer hospitals with approved palliative care team and 97% in those with non-approved palliative care teams) and assessing prognostic expectations. On the other hands, the adherence rate was low in educating the nursing and support staff regarding aspects of patient management and care planning (29% in cancer hospitals with approved palliative care team and 18% in those with non-approved palliative care teams). The rate of adherence between cancer hospitals with approved palliative care teams and those with non-approved palliative care teams differed in 16 of the 25 measures. For psychiatric assessment, the adherence rate was high (assessing and managing psychiatric symptoms directly, 99 versus 94%). On the other hand, the adherence rate varied for physical assessment (prognostic expectations, pain, activities of daily life), social assessment (financial, family problems, place of care) and coordination (discussing management with the physician directly, educating the staff regarding aspects of patient management).

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Table 3. Availability of psychiatric services in palliative care programs

| | Cancer hospitals with approved palliative care teams ($n = 80$) | Cancer hospitals with non-approved palliative care teams ($n = 153$) | $P$-value |
|---|---|---|---|
| Psychiatric service provided by palliative care teams, $n$ (%) | | | |
| Inpatient | 80 (100) | 153 (100) | >0.99 |
| Outpatient | 67 (84) | 109 (71) | 0.04 |
| Family | 57 (71) | 88 (58) | 0.04 |
| Bereaved family | 30 (38) | 38 (25) | 0.043 |
| Availability (inpatient) | | | |
| Response time to a request, $n$ (%) | | | |
| Within 24 h | 60 (75) | 77 (51) | <0.001 |
| Within 2–3 days | 17 (21) | 37 (24) | |
| Within 1 week | 3 (4) | 37 (24) | |
| Responding to an urgent request during business hours | 76 (95) | 118 (78) | 0.001 |
| Responding to an urgent request after office hours, $n$ (%) | | | |
| Corresponding directly | 19 (24) | 33 (22) | 0.043 |
| By substitution | 46 (58) | 70 (46) | |
| Unsupported | 15 (19) | 47 (31) | |
| Emergency care | | | |
| Corresponding directly | 23 (29) | 32 (22) | 0.31 |
| By substitution | 45 (56) | 81 (54) | |
| Unsupported | 11 (14) | 34 (23) | |
| Number of referrals/2 weeks, median (IQR) | 5.5 (4–10) | 4 (2–8) | 0.001 |
| Number of rounds for follow-up/week | 2 (1–3) | 1 (1–2) | <0.001 |
| Days from referral to discharge, median (IQR) | 20 (12–30) | 20 (7–30) | 0.26 |
| 1–7 days | 12 (17) | 36 (27) | |
| >1–4 weeks | 46 (67) | 77 (58) | |
| >1–3 months | 10 (15) | 17 (13) | |
| >3 months | 1 (1) | 1 (1) | |
| Percentage of patients who died during intervention | 30 (10–50) | 50 (20–66.25) | 0.040 |
| Total time spent on consultation and follow-up (min/week) | 741 (555–927) | 516 (393–638) | 0.002 |
| Availability (outpatient), $n$ (%) | | | |
| Response time to a request | | | |
| Within 24 h | 26 (37) | 39 (33) | 0.45 |
| Within 2–3 days | 18 (26) | 22 (19) | |
| Within 1 week | 25 (36) | 56 (48) | |
| Responding to an urgent request during business hours | 64 (92) | 90 (77) | 0.016 |
| Responding to an urgent request after office hours | | | |
| Corresponding directly | 12 (17) | 24 (21) | 0.85 |
| By substitution | 33 (47) | 52 (44) | |
| Unsupported | 25 (36) | 41 (35) | |

## DISCUSSION

Our survey provides information on the availability of psychiatric consultation-liaison services involved with palliative care programs in Japanese cancer hospitals. Compared with cancer hospitals with non-approved palliative care teams, those with approved palliative care teams were more likely to integrate psychiatric consultation-liaison services for cancer patients into their palliative care programs. Psychiatrists assessed cancer patients from various

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Table 4. Attitudes and practices of psychiatrists

| | Cancer hospitals with approved palliative care teams, $n$ (%) ($n = 80$) | Cancer hospitals with non-approved palliative care teams, $n$ (%) ($n = 153$) | $P$-value |
|---|---|---|---|
| Asking the requesting physician directly how you can best help them | | | |
| ≥80% | 56 (70) | 90 (59) | 0.07 |
| ≥40 and <80 | 19 (24) | 43 (29) | |
| <40% | 5 (6) | 20 (13) | |
| Anticipating potential problems | | | |
| ≥80% | 64 (80) | 110 (72) | 0.16 |
| ≥40 and <80% | 13 (16) | 31 (20) | |
| <40% | 3 (4) | 12 (8) | |
| Assessing and managing psychiatric symptoms directly | | | |
| ≥80% | 79 (99) | 144 (94) | 0.10 |
| ≥40 and <80% | 1 (1) | 8 (5) | |
| <40% | 0 (0) | 1 (1) | |
| Reviewing medical records | | | |
| ≥80% | 78 (98) | 135 (88) | 0.02 |
| ≥40 and <80% | 1 (1) | 15 (10) | |
| <40% | 1 (1) | 3 (2) | |
| Assessing prognostic expectations | | | |
| ≥80% | 74 (93) | 124 (81) | 0.02 |
| ≥40 and <80% | 6 (7) | 23 (15) | |
| <40% | 0 (0) | 6 (4) | |
| Assessing pain | | | |
| ≥80% | 66 (83) | 106 (69) | 0.02 |
| ≥40 and <80% | 10 (13) | 25 (16) | |
| <40% | 4 (5) | 22 (15) | |
| Assessing physical symptoms | | | |
| ≥80% | 67 (84) | 103 (67) | 0.004 |
| ≥40 and <80% | 9 (11) | 21 (14) | |
| <40% | 4 (5) | 29 (19) | |
| Assessing activities of daily life | | | |
| ≥80% | 57 (71) | 90 (59) | 0.04 |
| ≥40 and <80% | 14 (18) | 30 (20) | |
| <40% | 9 (11) | 33 (21) | |
| Assisting the primary care provider in communicating bad news | | | |
| ≥80% | 71 (89) | 129 (85) | 0.33 |
| ≥40 and <80% | 7 (9) | 15 (10) | |
| <40% | 2 (2) | 9 (5) | |
| Assessing financial resources | | | |
| ≥80% | 37 (46) | 54 (35) | 0.01 |
| ≥40 and <80% | 28 (35) | 43 (28) | |
| <40% | 15 (19) | 56 (37) | |
| Referrals to hospice, home care and other placements | | | |
| ≥80% | 47 (59) | 63 (41) | 0.01 |
| ≥40 and <80% | 15 (19) | 39 (26) | |
| <40% | 18 (23) | 51 (33) | |

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Table 4. *Continued*

| | Cancer hospitals with approved palliative care teams, *n* (%) (*n* = 80) | Cancer hospitals with non-approved palliative care teams, *n* (%) (*n* = 153) | *P*-value |
|---|---|---|---|
| Assessing needs in term of discharge support | | | |
| ≥80% | 42 (53) | 59 (39) | 0.01 |
| ≥40 and <80% | 21 (26) | 35 (23) | |
| <40% | 17 (21) | 59 (39) | |
| Assessing doctor–patient relationship | | | |
| ≥80% | 48 (60) | 78 (51) | 0.13 |
| ≥40 and <80% | 17 (21) | 33 (22) | |
| <40% | 15 (19) | 42 (27) | |
| Assessing family problems | | | |
| ≥80% | 56 (70) | 85 (56) | 0.02 |
| ≥40 and <80% | 18 (23) | 45 (29) | |
| <40% | 6 (7) | 23 (15) | |
| Eliciting the patient's understanding and opinions about the disease and its treatment | | | |
| ≥80% | 65 (81) | 106 (69) | 0.043 |
| ≥40 and <80% | 9 (11) | 24 (16) | |
| <40% | 6 (8) | 23 (15) | |
| Eliciting the family's understanding and opinions about the disease and its treatment | | | |
| ≥80% | 50 (63) | 74 (48) | 0.03 |
| ≥40 and <80% | 20 (25) | 47 (31) | |
| <40% | 10 (12) | 32 (21) | |
| Making notations on medical charts | | | |
| ≥80% | 76 (95) | 147 (96) | 0.68 |
| ≥40 and <80% | 2 (3) | 5 (3) | |
| <40% | 2 (3) | 1 (1) | |
| Planning psychiatric treatment with other team members | | | |
| ≥80% | 64 (80) | 109 (72) | 0.048 |
| ≥40 and <80% | 14 (18) | 31 (21) | |
| <40% | 2 (3) | 11 (7) | |
| Discussing patient management with the physician directly | | | |
| ≥80% | 58 (73) | 81 (53) | 0.004 |
| ≥40 and <80% | 16 (20) | 50 (33) | |
| <40% | 6 (7) | 22 (14) | |
| Recommending psychiatric pharmacotherapy | | | |
| ≥80% | 60 (75) | 114 (75) | 0.85 |
| ≥40 and <80% | 19 (24) | 33 (22) | |
| <40% | 1 (1) | 6 (4) | |
| Implementing medical intervention with permission from the primary team | | | |
| ≥80% | 58 (73) | 102 (67) | 0.51 |
| ≥40 and <80% | 7 (9) | 22 (15) | |
| <40% | 15 (19) | 28 (18) | |
| Implementing psychotherapeutic intervention with permission from the primary team | | | |
| ≥80% | 67 (84) | 109 (72) | 0.03 |
| ≥40 and <80% | 11 (14) | 30 (20) | |
| <40% | 2 (3) | 13 (9) | |

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Table 4. *Continued*

| | Cancer hospitals with approved palliative care teams, *n* (%) ($n = 80$) | Cancer hospitals with non-approved palliative care teams, *n* (%) ($n = 153$) | *P*-value |
|---|---|---|---|
| Participating in patient care, with other team members | | | |
| ≥80% | 72 (90) | 118 (77) | 0.01 |
| ≥40 and <80% | 8 (10) | 29 (19) | |
| <40% | 0 (0) | 6 (4) | |
| Educating the nursing and support staff regarding aspects of patient management and care plan | | | |
| ≥80% | 23 (29) | 27 (18) | <0.001 |
| ≥40 and <80% | 32 (40) | 36 (23) | |
| <40% | 25 (31) | 89 (59) | |
| Coordinating a family meeting to discuss further plans for care | | | |
| ≥80% | 23 (29) | 39 (26) | 0.40 |
| ≥40 and <80% | 46 (58) | 85 (56) | |
| <40% | 11 (14) | 28 (18) | |

perspectives with physicians, provided direct patient care, educated team members on the mental health domains and had a highly interdisciplinary approach to their work. Although there remains some variability in the infrastructure and delivery of psychosocial care in cancer settings, our results suggest that the integration model as psychiatric consultation-liaison services involved in palliative care teams is gaining acceptance in palliative care settings.

Although many institutions have developed elaborate support programs for a variety of symptoms, psychiatric symptoms and psychological problems of patients with cancer are still unrecognized, resulting in their not being offered access to the needed services (16,19,20,33). The National Comprehensive Cancer Network guidelines recommend screening for distress, which broadly defines emotional disturbances; however, only half the NCCN member institutions in the USA conducted screening to identify distressed patients (34). In palliative care programs, only half the National Cancer Institute cancer centers assessed and managed psychiatric disorders (4). Although various linkage programs, including screening programs and referrals, have been used in attempt to improve the continuity, the optimal system remains uncertain.

The full integration model aims to facilitate deinstitutionalization of dual assessment and pursues the best continuity and coordination for the complex needs (35). The full integration needs specialized types of interventions, expedited access to each other and close collaboration between professionals.

The involvement of psychiatric services in palliative care programs offers an advantage over conventional support programs in the detection and management of psychiatric disorders and psychosocial problems. First, psychiatrists provide medical care together with the palliative care teams, and a formalized mechanism for providing psychiatric services in the usual palliative care programs prevents the failure to connect individuals with the referred providers and gain the patients' acceptance of the referral (22,36,37). Second, psychiatrists assess the mental status and evaluate the decision-making capacity of patients, which contributes to enhanced quality of life for patients and families faced with life-threatening illness. Third, palliative care teams often face difficult settings and conflicting ethical issues. Psychiatrists can recognize and mitigate staff stress and address burnout.

Our survey revealed that cancer hospitals with certified palliative care teams offered integrated services between palliative care and consultation-liaison psychiatry; psychiatrists saw cancer patients with the palliative care teams directly, assessed cancer patients in a comprehensive manner and made the coordination process more effective with other staff members.

Although all of the cancer hospitals reported the provision of psychiatric consultation services, some barriers remain at the level of interaction among different clinicians serving the same patient. In our study, 75% of consultation-liaison psychiatrists on certified palliative care teams were ready to respond to urgent requests (within 24 h). About 30% of consultations were urgent requests (20). Many programs provided inpatient services. However, on an outpatient basis, only 40% of cancer hospitals were prepared for referral to consultation on the same day. Most cancer treatment has shifted from inpatient to ambulatory care settings (38) and the structure and processes must be modified accordingly.

On the other hand, a number of barriers to collaboration remain unresolved. The primary problems with attempts to integrate are structural and financial barriers. The integration requires the palliative care teams to expand their knowledge, perspectives and interest. The integrated palliative care teams have to deal with the needs of various patients appropriately, and it takes time to learn about the capabilities of

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the other systems, to decide how to work together and to communicate. They often feel 'consultation fatigue'. Also, the integration requires any of various staff to be involved at the clinical management. The cost of support staff can be overwhelming. For this reason, the approval of palliative care teams for national health insurance coverage encourages and facilitates the provision of psychiatric consultation-liaison services in palliative care programs under today's economic circumstances (25).

Most psychiatrists on palliative care teams see patients for direct consultation, assess their condition from various aspects and educate staff members regarding mental health problems. However, the quality and actual frequency of supportive care at each hospital varies. Psychiatrists are actively engaged in providing psychiatric care as well as coordination among physicians, nursing staff and the palliative care teams. On the other hand, educational activities are low in general. The key component to achieve the goal of full integration is the development of common clinical information systems. In previous studies, integrating information system is effective to facilitate communication between professionals (35). For approved palliative care teams, developing the information systems shared in the teams, such as clinical assessment tools, protocols about psychiatric treatment and education programs are needed. Also, for non-approved palliative care teams, establishment of a close contact and improving links between programs might be realistic strategies, rather than building up the full integration by constraint.

Our study had several limitations. First, the responses from our survey could be biased, because they were based on self-assessment and recalled information. Secondly, the response rate of the cancer hospitals with non-approved palliative care teams was low, possibly because low-activity institutions may be reluctant to participate in this type of survey. This may result in an overestimation of psychiatric consultation-liaison services and palliative care programs in cancer hospitals with non-approved palliative care teams. Third, the gold standard of psychosocial support has not yet been obtained. Although the questionnaire was generated based on a literature review and an expert panel, it has not been validated. The sphere of action of consultation-liaison psychiatry is complex, and it is difficult to identify new measurements for assessing the quality of the programs. It was recently suggested that the patients' subjective well-being and the medical team's difficulty in helping patients might be used to measure the effectiveness of consultation-liaison psychiatry. Further research is needed to improve the measurements applied to the consultation-liaison processes. Fourth, some results of this survey may reflect the impact from differences in country of practice and education.

In conclusion, these results suggest that the integration model between psychiatric consultation-liaison services and palliative care services holds some promise as an acceptable model for improving supportive care for patients with cancer. Although most designated cancer hospitals have a psychiatric consultation-liaison service, significant gaps remain in the delivery of care. Additional research is needed to establish the level of synergistic effect between the psychiatric service and the palliative medicine.

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## Conflict of interest statement

None declared.

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*Regular Article*

# Chronic repetitive transcranial magnetic stimulation increases hippocampal neurogenesis in rats

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*Aim:* While the underlying therapeutic mechanisms of repetitive transcranial magnetic stimulation (rTMS) treatment for depression remain unclear, recent animal studies have suggested that hippocampal neurogenesis might be required for the effects of antidepressant treatments including antidepressant drugs and electroconvulsive therapy. The aim of this study was to examine chronic rTMS effects on hippocampal neurogenesis in rats.

*Methods:* Using a 70-mm figure-of-eight coil, the stimulating parameters were set to 25 Hz and 70% of the rTMS device's maximum power. For 14 consecutive days, bromodeoxyuridine (BrdU) and 1000 pulses of rTMS were administered daily. Cell proliferation in the dentate gyrus was examined with immunohistochemistry.

*Results:* In the rTMS-treated group, BrdU-positive cells were significantly increased in the dentate gyrus.

*Conclusion:* Our results suggest that hippocampal neurogenesis might be involved in the antidepressant effects of chronic rTMS.

**Key words:** depression, hippocampus, neurogenesis, rat, transcranial magnetic stimulation.

REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) is a technique to repeatedly induce electric currents in a small area of the brain non-invasively. Recently, this technique has been applied to the treatment of several psychiatric and neurological diseases. Many clinical trials of rTMS have been conducted, most of which are for patients with depression.[1,2] Sachdev *et al.* showed antidepressant effects of chronic rTMS in a forced swim test in rodents,[3] and while many studies have examined the neurobiological therapeutic mechanisms of rTMS, they remain unclear.[4,5]

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Recent studies have suggested that hippocampal neurogenesis might be required for the effects of antidepressant treatments, although it may not be a major contributor to the development of depression.[6] In mice, antidepressant drug effects were disturbed by X-ray ablation of hippocampal neurogenesis.[7] As well as the chronic administration of several antidepressant drugs, electroconvulsive shock (ECS), analogous to human electroconvulsive therapy, increased hippocampal neurogenesis in rodents[8–10] and non-human primates.[11]

The aforementioned studies suggest that chronic rTMS could increase hippocampal neurogenesis and that this increase might be related to its therapeutic mechanisms on depression. However, to date, only one study has examined the effects of chronic rTMS on hippocampal neurogenesis in rodents and it did not show any significant increase of neurogenesis.[12] The lack of significant effects of rTMS in this study

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might be related to non-optimal rTMS conditions, considering that the optimal conditions for rTMS in the treatment of depression in humans and in experimental rodent models are still unknown. Hence, in this preliminary study, we examined chronic rTMS effects on hippocampal neurogenesis in rats using conditions similar to those of Sachdev *et al.*, which showed the antidepressant effects of chronic rTMS in the forced swim test in rats.[3]

## METHODS

### Animals

Sixteen-week-old male Sprague–Dawley rats (SLC Japan, Shizuoka, Japan) were used for all experiments. Rats were kept under standard conditions with a controlled 12-h light/dark cycle and fed standard diet and tap water *ad libitum*. The experimental protocol was approved by the Committee for Animal Experimentation of Osaka University Medical School. All efforts were made to minimize the number of animals used and their suffering.

### rTMS treatment

Rats were randomly assigned to the control group ($n = 5$) or the rTMS-treatment group ($n = 5$). rTMS was administered with a 70-mm figure-of-eight coil using a Magstim Super Rapid (Magstim, Whitland, UK). The rTMS parameters were as follows: stimulating frequency = 25 Hz, stimulating pulse intensity = 70% of the rTMS device's maximum power, train duration = 10 s. Four successive trains of rTMS (1000 pulses per day) were administered daily for 14 consecutive days (14 000 pulses in total). The coil was placed horizontally over the scalp and its handle was aligned parallel with the body of the rat. For sham stimulation of the control group, the coil was placed perpendicular to the scalp and all other conditions were identical to the conditions in the rTMS group. The real and sham rTMS treatments did not induce seizures or any apparent behavioral changes.

### Administration of bromodeoxyuridine

Bromodeoxyuridine (BrdU) (40 mg/kg in saline, Sigma, St. Louis, MO, USA), a thymidine analog that labels DNA during the S phase, was intraperitoneally administered to the two groups following the rTMS treatments daily (Fig. 1).

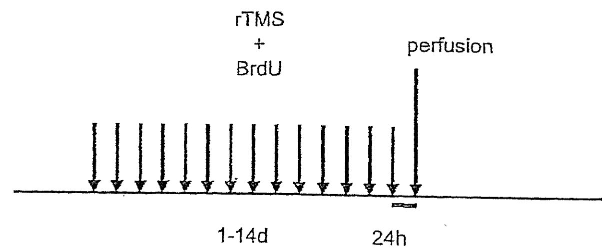


**Figure 1.** Experimental schema. Repetitive transcranial magnetic stimulation (rTMS) and bromodeoxyuridine (BrdU) were administered daily for 14 consecutive days. Rats were killed 24 h after the last BrdU administration.

### Tissue preparation

Twenty-four hours after the last BrdU administration, the rats were deeply anesthetized with sodium pentobarbital and transcardially perfused with saline, followed by 4% paraformaldehyde in 0.1 M phosphate-buffered saline. The brains were removed and postfixed in the same fixative at 4°C overnight and consecutive hippocampal paraffin sections 5 μm thick were prepared.

### Immunohistochemistry

After deparaffinizing, slide-mounted sections were incubated in 2 N HCl for 2 h and washed in Tris-buffered saline (TBS). Sections were blocked in TBS containing 10% normal rabbit serum at room temperature (RT) for 1 h and incubated overnight at 4°C with anti-BrdU antibody (1:100, OBT0030, Oxford Biotechnology, Oxford, UK) in TBS containing 10% normal rabbit serum. The next day, the sections were washed and incubated with biotinylated rabbit anti-rat immunoglobulin G (IgG) antibody (1:400, Vector Laboratories, Burlingame, CA, USA) at RT for 1 h. After washing, the sections were incubated with avidin-biotin peroxidase complex (Vectastain Elite ABC Kit, Vector Laboratories) at RT for 1 h. Peroxidase was visualized with 0.05% 3,3′-diaminobenzidine tetrahydrochloride (Sigma) in TBS containing 0.01% hydrogen peroxide. Counterstaining was performed with hematoxylin.

For double immunofluorescence staining, sections were preincubated in TBS containing 5% normal donkey serum and 0.1% Triton X-100 at RT for 1 h, and then incubated with primary antibodies in 3%

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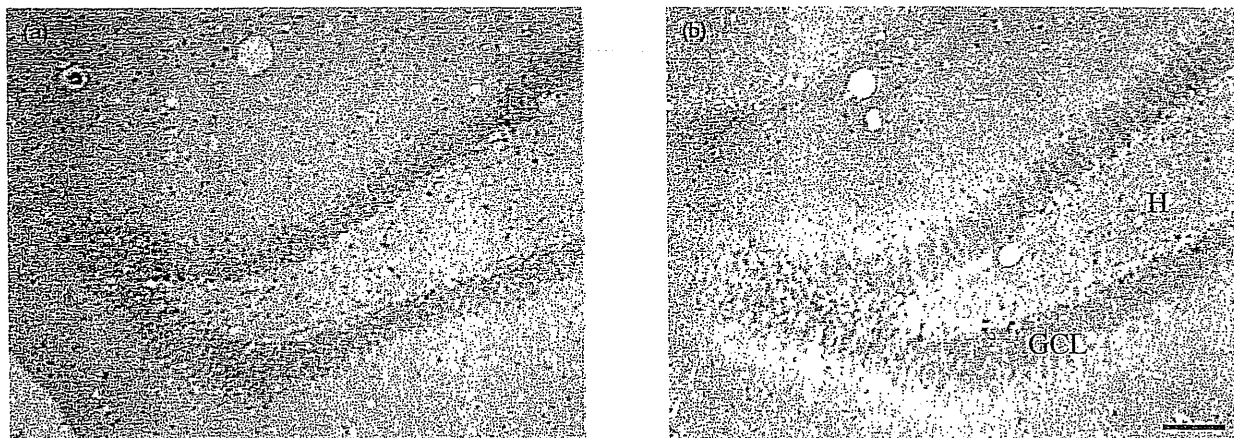


**Figure 2.** Bromodeoxyuridine-positive cells in the hippocampal dentate gyrus of (a) sham-treated control and (b) repetitive-transcranial-magnetic-stimulation-treated rats. Scale bar: 100 μm. GCL, granule cell layer; H, hilus.

bovine serum albumin (BSA) and 0.1% Triton X-100 overnight at 4°C. The primary antibodies used for immunofluorescence staining were as follows: anti-BrdU, and anti-neuron-specific class III β-tubulin (TuJ1, 1:500, MMS-435P, Covance, Berkeley, CA, USA). After washing, sections were incubated at RT for 1 h with biotinylated donkey anti-rat IgG (1:400, Jackson ImmunoResearch, West Grove, PA, USA) and Cy3-conjugated donkey anti-mouse IgG (1:400, Jackson ImmunoResearch), containing 1% BSA and 0.1% Triton X-100. After rinsing, the sections were incubated with Cy2-conjugated streptavidin (Jackson ImmunoResearch) at RT for 1 h.

### Quantitative analysis

Images of immunostained sections were captured from a microscope (Eclipse E800, Nikon, Tokyo, Japan) equipped with a color 3CCD camera (C5810, Hamamatsu Photonics, Hamamatsu, Shizuoka, Japan). The number of BrdU-immunoreactive cells in the granule cell layer (GCL) and the subgranular zone (SGZ, defined as two cell widths below the GCL) of the dentate gyrus was counted in six representative sections (−2.8 mm to −4.5 mm, relative to bregma according to the coordinates of Paxinos and Watson[13]) per animal using Adobe Photoshop software (Adobe Systems, San Jose, CA, USA) in a blinded fashion. The area of the GCL and the SGZ was quantified using NIH Image to estimate the number of BrdU-positive cells per unit area of the dentate gyrus. Statistical analysis was performed on the average number of BrdU-positive cells per section.

For immunofluorescent double labeling, sections were photographed using a Nikon Eclipse E800 microscope equipped with a VFM epi-FL attachment (Kawasaki, Kanagawa, Japan). At least 50 BrdU-positive cells per animal were analyzed to determine the proportions of BrdU-positive cells co-labeling with TuJ1.

The results are expressed as mean ± SEM. Differences between groups were compared using the Student's *t*-test. Statistical significance was defined as $P < 0.05$.

## RESULTS

Immunohistochemical staining showed that the majority of BrdU-positive cells were in the SGZ. There were significantly more BrdU-positive cells in the dentate gyrus of the rTMS-treated group as compared with the control group (Figs 2,3). Double immunofluorescence staining showed that most of the BrdU-positive cells were co-labeled with the neuronal marker TuJ1 (Fig. 4). The proportion of cells co-labeled with TuJ1 did not differ significantly between the rTMS-treated and control groups (TuJ1 co-labeled cells, 81.3 ± 2.5% and 80.4 ± 3.1%, respectively).

## DISCUSSION

In the present study, we examined the effects of chronic rTMS on neurogenesis in the dentate gyrus of adult rats. Our results showed that the number of

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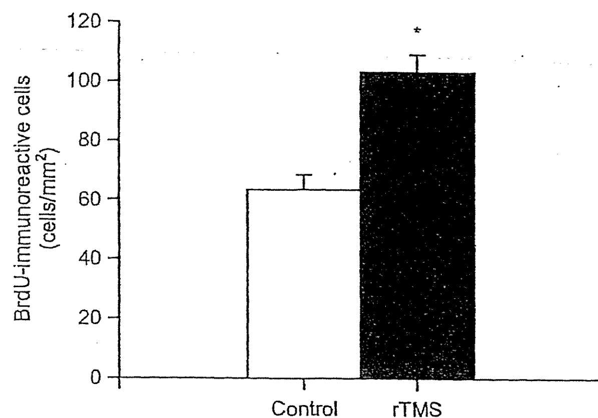


Figure 3. Quantification of bromodeoxyuridine (BrdU)-positive cells in the dentate gyrus. Chronic repetitive transcranial magnetic stimulation (rTMS) treatment significantly increased BrdU-positive cells (Control, 63.1 ± 5.1 cells/mm$^2$; rTMS, 102.3 ± 6.4 cells/mm$^2$). Results are shown as mean ± SEM. $^*P < 0.05$ vs control.

subgranular progenitor cells was significantly increased in the dentate gyrus. To our knowledge, this is the first report that chronic rTMS increased hippocampal neurogenesis.

Our results are in line with previous studies that showed that chronic treatments with ECS or various antidepressant drugs increase hippocampal neurogenesis in rodents,[6,8–10] and non-human primates.[11] Hence, it appears that hippocampal neurogenesis might be involved in the antidepressant effects of chronic rTMS, although our study did not utilize an animal model of depression or behavioral assessment.

In the present study, we used the similar conditions of chronic rTMS to those described by Sachdev *et al.*, who showed the antidepressant effects of rTMS in the forced swim test.[3] We used the same rTMS device and the same figure-of-eight coil placed over the scalp with identical alignment. The rTMS parameters were also similar to them (25 Hz stimulating frequency, 70% of the rTMS device's maximum power, 1000 pulses per day). The stimulating frequency was set to 25 Hz because Sachdev *et al.* showed that this frequency was most effective among the four frequencies tested (1, 5, 15, and 25 Hz). However, while they assessed the effects of rTMS on the second day after the five daily rTMS treatments, we conducted rTMS treatment for 14 consecutive days according to the schedule of the most recent human clinical trials on depression.[1,2]

Only one study, reported by Czéh *et al.*, has examined chronic rTMS effects on hippocampal neurogenesis in rats, and it showed that neurogenesis was not significantly increased.[12] In contrast with this study, we used a faster stimulating frequency (25 Hz vs 20 Hz) and more total pulses (14 000 pulses vs 5400 pulses). Our use of more powerful chronic rTMS treatment seems to be more appropriate for increasing hippocampal neurogenesis in rats.

The set of the conditions that modulate the intensity and distribution of electric currents and fields

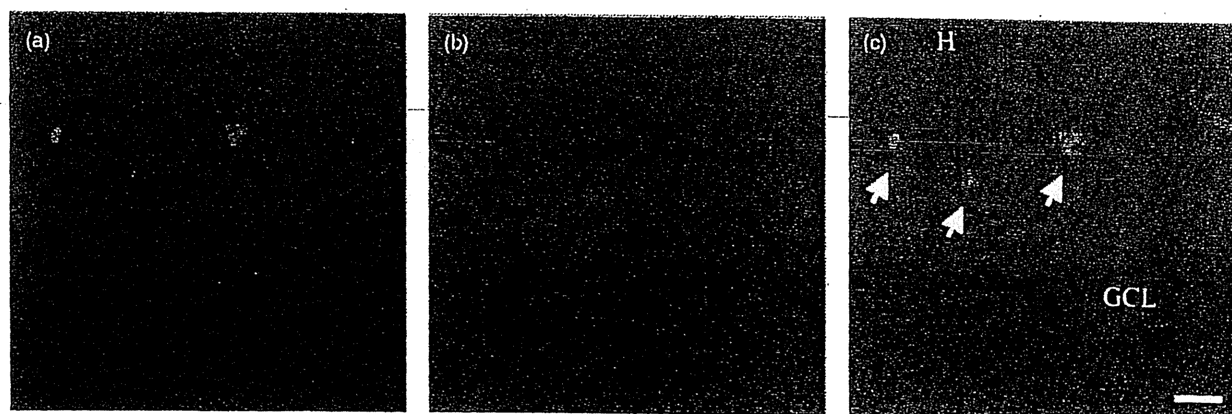


Figure 4. Double labeling with bromodeoxyuridine (BrdU) and neuronal marker anti-neuron-specific class III β-tubulin (TuJ1) after chronic repetitive transcranial magnetic stimulation (rTMS) treatment. Co-localization of (a, green) nuclear BrdU staining and (b, red) cytoplasmic TuJ1 staining. (c) The merged image shows TuJ1-positive cytoplasm surrounding BrdU-labeled nuclei (arrows). Scale bar: 10 μm. GCL, granule cell layer; H, hilus.

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induced by a single pulse in the rat brain (e.g. the shape, size, and location of the coil relative to the rodent small brain) is another important consideration.[14] Czéh *et al*. used a smaller round coil over the left frontal brain region and theoretically estimated the characteristics of the intensity and distribution of electric currents and fields.[12] Further studies are needed to evaluate their characteristics in the present study conditions and how they influence the effect of rTMS on hippocampal neurogenesis in rodents.

While most of the previous studies examined hippocampal neurogenesis roughly 1 month after a single or several injections of BrdU, our examinations were conducted on the next day after completion of 14 daily rTMS and BrdU treatments, and we assessed the overall proliferation during the daily treatments. Therefore, our results should be interpreted cautiously when comparisons are made with the results of the previous studies. In addition, the survival of nascent cells was not examined in our study. For more exact comparisons and discussions, further studies will be necessary to set the protocol of the BrdU treatment according to the previous studies under similar conditions of the chronic rTMS of our study.

In conclusion, the present study demonstrated an increase of hippocampal neurogenesis in rats using 14-day chronic rTMS, and it appeared that this increase might be related to the antidepressant effects of rTMS. To examine this relationship more exactly, further studies are needed using an animal model of depression and antidepressant drug-treated animal groups. While a standard rTMS protocol for the treatment of human depression has not been established, our results, even though not directly applicable to humans, could contribute to determining the optimal clinical rTMS conditions for such treatment.

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# Patients' perception of the usefulness of a question prompt sheet for advanced cancer patients when deciding the initial treatment: a randomized, controlled trial

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## Abstract

*Objective*: The objective of this study was to evaluate the patients' perception of the usefulness of a question prompt sheet (QPS) in facilitating the involvement of advanced cancer patients during consultation.

*Methods*: Advanced cancer patients attending their first consultation after diagnosis were randomly assigned to the intervention group (received QPS and a hospital introduction sheet (HIS)) or the control group (received HIS only). Analysis was conducted on an intention-to-treat basis. The primary outcome measure was patient rating of the usefulness of the material(s) (numerical rating scale of 0–10).

*Results*: Sixty-three advanced cancer patients (72.4% response rate) were enrolled and analyzed. Nearly three-quarters of patients in both groups read the material(s) before consultation. The rated usefulness of the material(s) for asking questions of physicians was significantly higher in the intervention group than in controls ($4.4\pm3.6$ and $2.7\pm2.8$, respectively; $p=0.033$). The mean score of the usefulness of the material(s) for understanding the treatment plan tended to be higher in the intervention group than in the controls ($4.9\pm3.6$ and $3.3\pm2.8$; $p=0.051$). The mean score of willingness to use the material(s) in the future was significantly higher in the intervention group than in the controls ($5.3\pm3.8$ and $2.8\pm2.8$; $p=0.006$). There were no significant differences between the groups in the average total number of questions asked by patients (median, 1.0; interquartile range in both groups, 2.0).

*Conclusions*: QPS provided before oncology consultation may be useful for advanced cancer patients, on the other hand, it did not directly promote patient confidence to ask questions.
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Keywords: cancer; oncology; communication; patient participation; question prompt sheet

## Introduction

In cancer care, good communication is essential for building patient–physician relationship. Patient-centered approaches have been proposed for improving communication between patients and physicians, including the use of a question prompt sheet (QPS) [1–5].

A QPS is a structured list of questions covering the items a patient may want to ask their physicians regarding their illness and treatment. Patients are given the QPS before consultation for them to read and to determine which questions they would like to ask. In cancer setting, randomized controlled trials have been performed to evaluate the effectiveness of QPS in encouraging cancer patients regardless of the cancer stage to obtain more information about their illness and its treatment. Patients who received QPS asked more questions [6,7] and rated the QPS as significantly more useful for the family [6] as well as more helpful in aiding communication with their physician compared with a control group [8]. However, the patients in the previous randomized studies were commonly at an early disease stage as opposed to the metastatic stage, and their prognosis was typically in the order of years (i.e., 1–5 years), except in one study examining palliative care patients [7,9].

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Decision making in patients at the time of initial diagnosis of advanced cancer is quite different than for patients with early stage cancer who are receiving treatments with curative intent or for those with advanced cancer who are already approaching the terminal phase of their illness [10]. Patients who have just been diagnosed with advanced cancer are stunned by the news of having incurable cancer and by the prospect of limited life expectancy [11]. Nevertheless, they are often obliged to make urgent decisions, and this may require an exhaustive search for information about their condition. When deciding on the initial treatment, good communication between an advanced cancer patient and a physician is very important to achieve a better understanding of the medical condition and for the patient to take a more autonomous role in medical care. Therefore, it is important to investigate whether QPS can help advanced cancer patients to ask questions and to collect information when making decisions.

Moreover, Dimoska *et al.* point out that the lack of research examining the use of a QPS by non-English-speaking cancer patients. There are no cancer-specific QPSs that have been translated to other languages [9]. Our previous studies in Japan found that some patients preferred that physicians give them a chance to ask questions, while others did not know what questions to ask and wanted to know the questions most frequently asked by other patients [12,13]. In Japan, it might prove helpful to provide cancer patients with a QPS containing sample questions commonly asked.

In previous QPS studies, the number or duration of questions asked by patients showed a poor correlation with subjective outcomes such as satisfaction [14,15]. Bruera *et al.* described that patient expectations were frequently not met and patients are often not satisfied with information needs [8]. Better communication may not depend on number or duration of questions patients ask. Therefore, in the current study, we investigated the patients' perception of the usefulness of a QPS provided to patients newly diagnosed with advanced cancer in helping them to decide on their initial treatment. Our primary goal was to specifically determine how useful patients found the QPS compared with a hospital introduction sheet (HIS) containing a space in which patients could write their questions freely.

## Patients and methods

### Setting and participants

The study was performed in the National Cancer Center Hospital East, Japan from February to December 2008. The enrolled subjects were patients with advanced cancer (i.e., locally advanced, metastatic, recurrent) presenting for their first consultation with an oncologist at thoracic oncology division or gastrointestinal oncology division to discuss the treatment plan. We consecutively recruited patients with advanced nature of the cancer identified from the referral note from their previous physician. Some patients were excluded after recruitment because they were diagnosed as cancer in early stage. The inclusion criteria for the potential patients were as follows: (1) informed of advanced cancer diagnosis, (2) aged 20 years or older, (3) no serious physical or psychological distress recognized by the primary physicians or researchers, (4) no cognitive disorder, (5) able to communicate in Japanese.

### Procedure

The potential patients were invited to participate consecutively by their initial physician during the consultation. Thereafter, patients were informed of the purpose and requirements of the study by a researcher. After obtaining written consent, patients were randomly given an envelope, which assigned them to either the intervention group (received QPS and HIS) or the control group (received HIS only). Patients in both the groups were instructed to read the material(s) before their next consultation. Following the next consultation, patients in both groups were asked to complete a questionnaire that assessed the usefulness of the material(s) and their level of satisfaction with the consultation. In addition, the patients were asked about the number and content of the questions for their physician (Figure 1).

The study was approved by the ethics committees of the National Cancer Center, Japan, and registered with UMIN-CTR, number 000001047 (https://center.umin.ac.jp/cgi-open-bin/ctr/ctr.cgi?function = brows&action = brows&recptno = R000001254&type = summary&language = E).

### Question prompt sheet

We prepared an initial draft of QPS that contained 63 questions based on previous QPS studies [3,8,14,15] and our previous study on the preferences of Japanese cancer patients regarding the disclosure of bad news [12]. Before the study, we performed interviews with 14 cancer patients and five oncologists and made modifications to the QPS, which included removal of 15 similar questions, addition of five extra questions and some minor changes. The final QPS was a 10-page A4 sheet containing 53 questions grouped into 10 topics and a space for new questions (see Appendix A for the questions of the final QPS).

### Hospital introduction sheet

The HIS was designed to provide information on the various services and the faculty of the National

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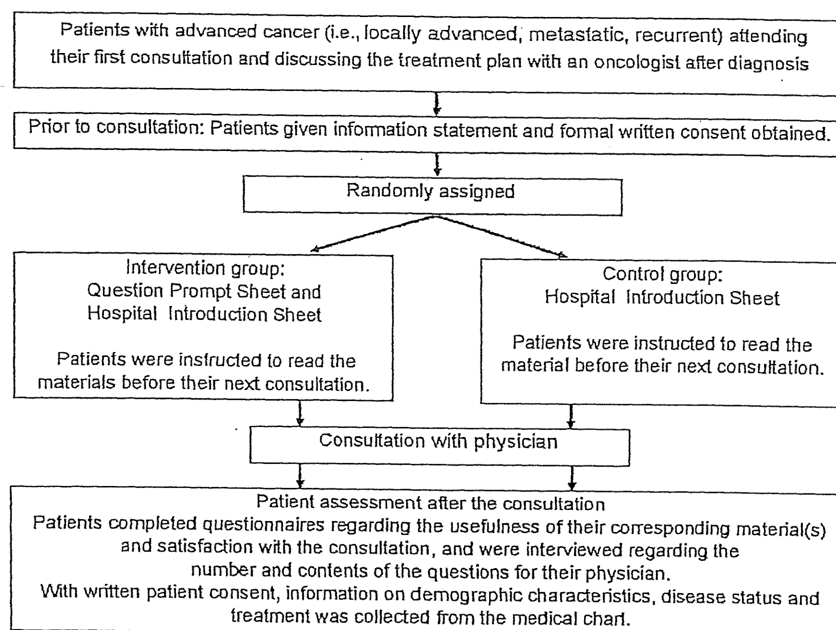


**Figure 1.** Study procedure

Cancer Center Hospital East, Japan. In addition, the HIS provided information on treatment and contained a space for any questions or messages the patients may have wanted to write.

## Measures

### Usefulness of the material(s)

Based on a previous study [8], we asked three questions regarding the usefulness of the material(s). Patients were asked to rate the following (assessed by a numerical rating scale of 0 to 10 where 10 represents completely agree and 0 represents completely disagree): (1) the material helped me to ask relevant questions of physicians; (2) the material was useful in understanding the treatment plan; and (3) I will use the material before any consultation in the future.

### Satisfaction with the consultation

Patient satisfaction with the consultation was assessed using five items adapted from a previous study [8]. Patients were asked to rate the following (assessed by a numerical rating scale of 0 to 10): (1) the physician answered all the questions; (2) I was able to ask all the questions I wanted to ask; (3) I was able to understand the condition of my disease; (4) I was able to comprehend the treatment plan; and (5) I am satisfied with the consultation.

### Number and contents of the questions

The number and contents of the questions were measured by interview immediately after the consultation. We did not use audiotape to record the consultation as in previous studies because audiotaping of consultations is an extremely rare practice in Japan. We feared that audiotaping may not be acceptable to patients and physicians and may adversely affect recruitment to the study. We asked the patients the following questions and determined the estimated number of patient questions: Did you ask the physician some questions? If so, what kind of questions did you ask? For example, if patient answered that he asked the physician about the side effect and the cost of treatment, we estimated the number of patient questions at 2.

### Patient characteristics

With written patient consent, information on demographic characteristics, disease status and treatment was collected from the medical chart.

## Sample size calculations

The primary outcome measure was the patient rating of the usefulness of the material(s). Based on a previous study [8], we calculated sample size using the following parameters: 80% power, 0.05 level of significance, 5.70 average score of usefulness increasing to 7.90, with 3.08 as standard deviation. The sample required to detect this difference was 32 per arm. Therefore, the required total sample size was 64 patients.

## Statistical analysis

Statistical analysis was conducted on an intention-to-treat basis. The primary outcome measure was patient rating of the usefulness of the material(s). The secondary outcome measures included satisfaction with the consultation, number of total questions and frequency of questions. Differences

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