

DESCRIPTION

MEDICAL ASSISTANCE SYSTEM AND MEDICAL ASSISTANCE METHOD

TECHNICAL FIELD

5 [0001]

The present invention relates to a medical assistance system and a medical assistance method, and particularly relates to a medical assistance system and a medical assistance method for sharing information on a person needing assistance between a person relating to the person needing assistance and a medical profession.

BACKGROUND ART

[0002]

15 In recent years, an aging society has progressed, and the population of persons needing assistance, such as elderly persons, has been significantly increased. In such a situation, an increase in demand for nursing care and medical care more than ever will be expected in the future. Thus, establishment of a comprehensive community assistance service providing structure (a community-based integrated care system) has been promoted so that elderly persons etc. can continue lives in their own ways as much as possible in familiar areas until the end of the lives for the purpose of holding dignity and assisting an independent life.

For realizing the community-based integrated care system, cooperation between nursing care and medical care has been typically broadly demanded. For example, when nursing care-relating information held by a nursing care facility etc. and medical care-relating information held by a medical institution can be shared using an information processing technique, health conditions of the elderly persons etc. can

be consistently grasped from a normal state to lives after hospital discharge through a disease period, and optimal nursing care, medical care, etc. can be performed according to each elderly person etc.

5 [0003]

For example, Patent Literature 1 describes a nursing care system in cooperation with a medical care system for sharing information between medical care and nursing care. Specifically, in the system of Patent Literature 1, access
10 authority is defined so that cooperation between the medical care and the nursing care can be realized while safety of information with high confidentiality.

Moreover, Patent Literature 2 describes an elderly person information management system utilizing a network.
15 Specifically, in the system of Patent Literature 2, a health condition of an elderly person and various requests and consultations can be grasped as needed, and information on the elderly person is transmitted to a medical institution etc.

20 CITATION LIST

PATENT LITERATURE

[0004]

PATENT LITERATURE 1: JP 2015-028773

PATENT LITERATURE 2: JP 2010-244091

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SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0005]

However, for a long time since cooperation between the
30 nursing care and the medical care has been argued for realizing the community-based integrated care system, various systems such as Patent Literatures 1 and 2 have been built. However,

actually in a current situation, it cannot be said that favorable cooperation between the nursing care and the medical care is realized.

[0006]

5 One reason is a problem that expression utilized between a person relating to a person needing assistance, such as a caregiver, and a medical profession varies. For example, in a nursing care field, the caregiver etc. express a health condition of an elderly person etc. as in "a facial color looks
10 pale and there are a feeling of vomiting and a feeling of cold sweat upon body touch." However, in a medical care field, the medical profession expresses such a state as in "a blood pressure is 80/40, SpO2 is 89%, and JCS is double digits".

Needless to say, in such a different expression situation,
15 favorable cooperation between the nursing care and the medical care cannot be realized. A medical care side has argued that cooperation between the nursing care and the medical care cannot be realized without study of the medical care by the caregiver etc. However, from a point of view of the nursing care, a
20 nursing care side focuses on an aspect for assisting the lives of the elderly persons etc., and expression utilized by the caregiver etc. simply indicates the health condition based on the daily life of the elderly person etc. Thus, the nursing care field is far from well-functioning even after a sudden
25 change to use of medical care terms. Conversely, there is a probability of bringing about obstacles to a daily nursing care service.

[0007]

Adverse effects due to unfavorable cooperation between
30 the nursing care and the medical care include a current condition where admission to a hospital is determined only after the health condition becomes too bad and there are many elderly

persons etc. who cannot go back to their homes or nursing care facilities again after hospital discharge.

For avoiding this situation, it is important to determine proper admission timing even on the nursing care side. However, for finding health devastation/exacerbation as quick as possible, a feeling generated from doctor's experience linked to a diagnosis process or treatment constantly repeated in the head of the doctor according to a health condition of each patient in the medical care field is necessary. However, sharing of such a feeling by the nursing care side cannot be realized in a short space of time, and is difficult in real life. [0008]

Meanwhile, daily muttering intuitively felt by the person relating to the person needing assistance, such as the caregiver having contact with the elderly person etc. on a daily basis, often include an important element as an indication of the health condition of the elderly person etc. However, it is difficult for the doctor to pick up only important contents from an endless number of muttering of the caregiver etc. to properly determine the health condition of the elderly person etc. [0009]

Further, the person relating to the person needing assistance, such as the caregiver, needs to pay attention to many things, and sometimes encounters different troubles every day. It is difficult to request responsible determination for the caregiver etc. facing an enormous business volume every time. Specifically, the caregivers etc. may include non-professional persons looking after or caring for family members or relatives other than licensed persons etc. Thus, imposition of a similar responsibility is rough on these people. [0010]

For these reasons, the present invention has been made

in view of the above-described problems, and is intended to provide a medical assistance system and a medical assistance method capable of easily, promptly, and accurately determining a health condition of a person needing assistance by both of
5 a person relating to the person needing assistance and a medical profession to realize a community-based integrated care system in preferable cooperation between nursing care and medical care.

10 SOLUTION TO PROBLEM

[0011]

According to the medical assistance system of the present invention, the above-described programs are solved by a medical assistance system for sharing, via a computer, information on
15 a person needing assistance between a person relating to the person needing assistance and a medical profession. The computer includes a health information acquiring unit configured to acquire health information indicating a health condition of the person needing assistance; a score calculation
20 unit configured to score, as a numerical value, the health information according to preset evaluation items of a medical institution, thereby calculating a score indicating the health condition of the person needing assistance; a common language conversion unit configured to convert the score into a common
25 language commonly recognizable as an indicator for the health condition by both of the person relating to the person needing assistance and the medical profession; an admission necessity determination unit configured to determine as admission required when the score does not satisfy a predetermined
30 requirement; and a result display unit configured to display the score or the common language.

[0012]

Moreover, according to the medical assistance method of the present invention, the problems are solved by a medical assistance method for sharing, via a computer, information on a person needing assistance between a person relating to the person needing assistance and a medical profession. The computer executes the health information acquiring processing of acquiring health information indicating a health condition of the person needing assistance; the score calculation processing of scoring, as a numerical value, the health information acquired by the health information acquiring processing according to preset evaluation items of a medical institution, thereby calculating a score indicating the health condition of the person needing assistance; the common language conversion processing of converting the score calculated by the score calculation processing into a common language commonly recognizable as an indicator for the health condition by both of the person relating to the person needing assistance and the medical profession; the admission necessity determination processing of determining as admission required when the score calculated by the score calculation processing does not satisfy a predetermined requirement; and the result display processing of displaying the score calculated by the score calculation processing or the common language converted by the common language conversion processing.

[0013]

As described above, in the medical assistance system or the medical assistance method of the present invention configured as described above, the score indicating the health condition of the person needing assistance is, as the numerical value, calculated according to the preset evaluation items of the medical institution for the health information obtained by the person relating to the person needing assistance, such as

a caregiver, and indicating the health information on the person needing assistance, such as an elderly person. The score is converted into the common language commonly recognizable as the indicator for the health condition by both of the person relating to the person needing assistance and the medical profession. Moreover, when the score does not satisfy the predetermined requirement, i.e., the score is equal to or higher than a predetermined reference value under a condition where a higher score indicates a worse health condition, or the score is equal to or lower than a predetermined reference value under a condition where a lower score indicates a worse health condition, it is determined as admission required. Then, the score or the common language converted from the score are displayed so that both of the person relating to the person needing assistance and the medical profession can check the score or the common language.

As described above, in the present invention, both technical determinations of nursing care determination in a nursing care field and medical care determination in a medical care field are emphasized and scored, and the common language for linking the caregiver etc. and the medical profession with different types of expertise is set. With this configuration, both of the caregiver etc. and the medical profession can easily, promptly, and accurately determine the health condition of the elderly person etc., and admission necessity can be automatically determined. As a result, a community-based integrated care system in preferable cooperation between nursing care and medical care can be realized.

Moreover, the health condition of the elderly person etc. is scored and converted into the common language. Thus, such a health condition can be understood by anyone, and a reason for admission determination can be grasped in an objective and

logical manner (visualization). Specifically, perfect admission timing is not misjudged. Thus, the style of "SPENDING MOST OF ONE'S TIME AT HOME, BUT STAYING IN HOSPITAL ON OCCASIONAL BASIS" can be established while dignity of the elderly person etc. is held and an independent life of the elderly person etc. is assisted, and the life of the elderly person etc. can be suitably assisted. Meanwhile, the caregiver etc. and the medical profession can understand, in an objective and logical manner, the way to reflect services performed by these persons, and therefore, such a feeling of satisfaction that the caregiver etc. and the medical profession directly participate in health management for the elderly person etc. can be obtained.

For the caregiver etc., the same service with the same quality can be carried out according to a certain rule (service standardization), and therefore, the amount of service by the caregiver etc. having responsibility on one's own judgement and stress on such a caregiver can be reduced.

[0014]

According to a preferable configuration of the above-described medical assistance system, the health information acquiring unit may extract a preset predetermined keyword from text data input by the person relating to the person needing assistance.

[0015]

As described above, the predetermined keyword is extracted from the text data such as unintentional muttering of the caregiver etc. having contact with the elderly person etc. on a daily basis, and is scored. Thus, e.g., every slight elderly person change felt by the caregiver etc. in a daily life can be reflected, and the health condition of the elderly person etc. can be more accurately determined. Moreover, for the caregiver etc., a reporting method emphasizing a daily dialogue

between the caregivers etc. can be employed, and therefore, time and effort are reduced without the need for a special process.
[0016]

According to a preferable configuration of the
5 above-described medical assistance system, the health information acquiring unit may extract a preset predetermined keyword from audio data audio-input by the person relating to the person needing assistance.
[0017]

10 As described above, audio (words) emitted from the caregiver etc. is read, and the predetermined keyword is extracted from the audio data and is scored. Thus, time and effort for input to a terminal by the caregiver etc. can be omitted. As a result, e.g., every slight elderly person change
15 felt by the caregiver etc. in a daily life can be reflected, and the health condition of the elderly person etc. can be more accurately determined. When the system is activated via audio, operability is more improved.
[0018]

20 According to a preferable configuration of the above-described medical assistance system, the score calculation unit may calculate the score for each evaluation item at different score rates.
[0019]

25 As described above, the score is calculated for each evaluation item at the different score rates. Thus, an abnormality directly linked to a life, such as a consciousness condition, a respiratory condition, and a circulatory can be greatly reflected on the score, and the health condition of the
30 elderly person etc. can be more accurately determined.
[0020]

According to a preferable configuration of the

above-described medical assistance system, the result display unit may display an indication including the contents of an instruction for subsequent action for the person needing the assistance.

5 [0021]

As described above, the indication including the contents of the instruction for subsequent action such as immediate admission or a wait-and-see approach is displayed according to a determination result. Thus, the style of "SPENDING MOST OF
10 ONE'S TIME AT HOME, BUT STAYING IN HOSPITAL ON OCCASIONAL BASIS" can be, without misjudgement of the perfect admission timing, established while the dignity of the elderly person etc. is held and the independent life of the elderly person etc. is assisted, and the life of the elderly person etc. can be more suitably
15 assisted. Specifically, a prompt response to the elderly person etc. determined as admission required can be made.

[0022]

According to a preferable configuration of the above-described medical assistance system, the result display
20 unit may together display, on a map, the score or the common language and position information on the person needing assistance in a state in which admission necessity is identifiable.

[0023]

25 As described above, the information on the elderly person etc. is displayed on the map so that, e.g., an area or a nursing care facility at which an elderly person is present and a health condition of such an elderly person can be visually grasped at one view.

30 [0024]

According to a preferable configuration of the above-described medical assistance system, the common language

may be a character or a mark indicating weather information for figuratively expressing the health condition of the person needing assistance as in weather.

[0025]

5 As described above, a weather forecast method is used as the common language for linking both of the nursing care and the medical care with different types of expertise. This prevents both of the caregiver etc. and the medical profession from relying on technical terms thereof, and the quality of the
10 health condition of the elderly person etc. can be more directly understood by anyone by means of expression used for weather forecast, such as fine weather, cloudy weather, or rainy weather.

[0026]

15 According to a preferable configuration of the above-described medical assistance system, the computer may further include a history information storage unit configured to store, for each person needing assistance, history information indicating an attribute and a previous health
20 condition of the person needing assistance, and the admission necessity determination unit may determine the admission necessity according to the attribute and the history information as determination factors.

[0027]

25 As described above, the history information indicating the health condition, such as the attribute such as the age or sexuality of the elderly person etc. and a previous diagnosis result or medical history, is held. In determination on the admission necessity, e.g., these attributes and a variation
30 amount from the previous health condition included in the history information are taken into consideration, and therefore, the admission necessity can be more accurately determined

according to each elderly person etc.

[0028]

According to a preferable configuration of the above-described medical assistance system, the history information storage unit may store information indicating the number of days for previous hospital stay of the person needing assistance in association with the score or the common language upon admission.

[0029]

As described above, the actual number of days for previous hospital stay is stored in association with, e.g., the score or the common language upon determination as admission required, and the determined score etc. upon admission and a length pattern of the actual number of days for hospital stay can be taken as big data, and can be statistically analyzed. By such analysis, proper viewing of a medical care cost can be realized.

[0030]

According to a preferable configuration of the above-described medical assistance system, the computer may further include a road traffic information acquiring unit configured to acquire road traffic information indicating a traffic jam or restriction, and a transportation time prediction unit configured to predict transportation time to the medical institution according to an association between the position information on the person needing assistance and determined as admission required and the road traffic information. The result display unit may display the transportation time of the person needing assistance to the medical institution or the arrival time of the person needing assistance at the medical institution.

[0031]

As described above, the road traffic information

indicating, e.g., the traffic jam or restriction acquired from the outside and the position information on, e.g., the nursing care facility at which the elderly person determined as admission required is present are associated with each other, and the transportation time to the medical institution as an admission destination such as a hospital is calculated and displayed considering congestion etc. Thus, e.g., the more accurate time of arrival of the elderly person at the hospital can be obtained. Thus, on a medical institution side, a clear indication of time for admission preparation can be obtained. Moreover, the efficiency of a service of the medical profession on an admission reception side, such as a nurse, can be enhanced, and overtime work can be reduced.

ADVANTAGEOUS EFFECTS OF INVENTION

[0032]

According to the medical assistance system and the medical assistance method of the present invention, the medical assistance system and the medical assistance method capable of easily, promptly, and accurately determining the health condition of the person needing assistance by both of the person relating to the person needing assistance and the medical profession to realize the community-based integrated care system in preferable cooperation between the nursing care and the medical care can be provided.

BRIEF DESCRIPTION OF DRAWINGS

[0033]

FIG. 1 is a conceptual diagram of a community-based integrated care system in cooperation between nursing care and medical care.

FIG. 2 is a conceptual diagram of the community-based

integrated care system in cooperation between the nursing care and the medical care.

FIG. 3 is a schematic configuration diagram of a medical assistance system.

5 FIG. 4 is a diagram of a configuration of the medical assistance system in terms of function.

FIG. 5 is a table of one example of evaluation items.

FIG. 6 is a table of one example of the evaluation items.

FIG. 7 is a table of one example of a common language.

10 FIG. 8 is a flowchart of the flow of medical assistance processing.

FIG. 9 is a flowchart of the flow of score calculation processing.

15 FIG. 10 is a table of one example of muttering evaluation items.

FIG. 11 is a flowchart of the flow of admission necessity determination processing.

FIG. 12 is a schematic chart of a relationship between a total score change and an admission pattern.

20 FIG. 13 is a conceptual diagram of a service flow in a nursing care facility and a medical institution utilizing the medical assistance system in association with each other.

FIG. 14 is a view of one example of a weather map indicating a health condition of a care receiver.

25 FIG. 15 is a view of one example of a care receiver list before input of health information.

FIG. 16 is a table of one example of a descriptive text in a speech balloon.

30 FIG. 17 is a view of one example of the care receiver list after results have been displayed.

FIG. 18 is a view of one example of the weather map indicating the health condition of the care receiver.

DESCRIPTION OF EMBODIMENTS

[0034]

Hereinafter, one embodiment (hereinafter referred to as
5 a "present embodiment") of the present invention will be described.

The present embodiment relates to an invention of a medical assistance system capable of sharing information on a person needing assistance, such as an elderly person, between
10 a person (hereinafter referred to as a "caregiver") relating to the person needing assistance, such as a caregiver, and a medical profession to realize cooperation between nursing care and medical care.

Note that the nursing care described in the present
15 embodiment is not limited to nursing care in the narrow sense, such as looking after and caring for an elderly person, a disabled person, an ill person, etc., and means that some sort of assistance for living, such as widely- and generally-known care, is provided to the person (hereinafter referred to as a
20 "care receiver") needing assistance.

Moreover, the embodiment described below is merely one example for the sake of easy understanding of the present invention, and is not intended to limit the present invention. That is, changes and modifications can be made without departing
25 from the gist of the present invention, and needless to say, the present invention includes equivalents thereof.

[0035]

<Community-Based Integrated Care System>

First, the outline of a community-based integrated care
30 system realized by means of a medical assistance system S according to the present embodiment and realizing preferable cooperation between the nursing care and the medical care will

be described.

FIGS. 1 and 2 are conceptual diagrams of the community-based integrated care system in cooperation between the nursing care and the medical care.

5 [0036]

The care receiver such as an elderly person lives at home in some cases, and on the other hand, lives at, e.g., an elderly facility or a nursing care facility in other cases. In the present embodiment, both cases will be described as in-home.
10 In the former case, a family member or a relative mainly provides the nursing care to the care receiver in many cases. In the latter case, a so-called dedicated nursing care staff such as licensed persons including a certified care worker and a certified social worker and other care staff provides the
15 nursing care to the care receiver.

As illustrated in FIG. 1, the care receiver in the above-described environment lives while receiving assistance from a community nursing care service, a home-visit nursing station, and a primary care doctor for home medical care. For
20 example, when a health condition is deteriorated, the care receiver is admitted to a medical institution such as an equipped hospital so that the care receiver can live in one's own way while having an individual dignity of "SPENDING MOST OF ONE'S TIME AT HOME, BUT STAYING IN HOSPITAL ON OCCASIONAL
25 BASIS."

[0037]

Specifically, as illustrated in FIG. 2, while the care receiver is living in one's own way at home, the elderly facility, the nursing care facility, etc., the care receiver receives,
30 according to deconditioning/exacerbation, house visit by the primary care doctor, sees the primary care doctor in a doctor's office, or is admitted to the medical institution such as a

hospital to receive treatment and health performance evaluation. In a case where the care receiver has a problem on the health condition, the care receiver is transferred to a long-term care bed to receive more-satisfactory medical care. However, when
5 the health condition is improved, the care receiver can leave the hospital and go back to the home, the elderly facility, the nursing care facility, etc., and can live in one's own way. The above-described cycle is repeated so that the care receiver can have the individual dignity and live in one's own way until the
10 end of one's life through a stable phase, a terminal phase (senility), and end-of-life care.

The medical assistance system S of the present embodiment specifically relates to determination when the care receiver receives the house visit by the primary care doctor or sees the
15 primary care doctor in the doctor's office or when the care receiver is admitted to the medical institution according to deconditioning/exacerbation as described above.

[0038]

Note that the caregiver in the present embodiment is not
20 limited to the dedicated nursing care staff, and includes all persons involved in the nursing care for the care receiver, such as a family member or a relative providing some sort of assistance such as care for the care receiver. Moreover, the medical profession in the present embodiment indicates a person
25 involved in a medical service and having a high level of skill for the medical care, such as a doctor of a medical institution, a nurse, and a primary care doctor.

[0039]

<Outline Configuration of Medical Assistance System
30 according to Present Embodiment>

Next, a configuration of the medical assistance system S, i.e., a system (device) for realizing cooperation between

the nursing care and the medical care, will be described with reference to FIG. 3.

FIG. 3 is a schematic configuration diagram of the medical assistance system S according to one embodiment of the present invention.

[0040]

As illustrated in FIG. 3, in the present embodiment, multiple devices including a medical assistance device (hereinafter referred to as a "subject device 1") relate to medical assistance, i.e., cooperation between the nursing care and the medical care.

Specifically, the medical assistance system S includes the subject device 1 provided on a medical institution side, a medical profession terminal 2 placed on the medical institution side and communicably connected to the subject device 1 via a local network such as an in-hospital LAN, and a caregiver terminal 3 placed at a nursing care facility etc. and communicably connected via a communication network N such as the Internet, 3G, or 4G. Audio input devices 4 are each communicably connected to the medical profession terminal 2 and the caregiver terminal 3.

That is, in the present embodiment, cooperation between the nursing care and the medical care is realized by the above-described device group functioning as the system.

[0041]

The subject device 1 includes a server computer managed by the medical institution, for example. Note that a detailed configuration of the subject device 1 will be described later.

[0042]

Each of the medical profession terminal 2 and the caregiver terminal 3 includes a data transmission unit and a data receiving unit for transmission/reception of data, and

therefore, data exchange with the subject device 1 is allowed. Moreover, the caregiver terminal 3 includes, for inputting health information on the care receiver by the caregiver, an input section such as a keyboard or a touch panel in addition to the audio input device 4 such as an audio input microphone. Further, the medical profession terminal 2 also includes, for inputting various types of information by the medical profession, an input section such as a keyboard or a touch panel in addition to the audio input device 4 such as an audio input microphone.

Note that the medical profession terminal 2 and the caregiver terminal 3 allow at least data communication, and are not specifically limited as long as received data can be displayed. In addition to a terminal dedicated to medical assistance, various devices such as a versatile personal computer, a tablet terminal, a smartphone, a mobile phone, and a PHS can be utilized.

[0043]

<Detailed Configuration of Medical Assistance Device according to Present Embodiment>

Next, the detailed configuration of the subject device 1 will be described.

The subject device 1 includes the server computer managed by the medical institution. The subject device 1 has, as components, a CPU as an arithmetic unit configured to perform control and data calculation/processing, a ROM as a storage device dedicated to reading, a RAM as a main memory (a main storage device), a communication interface configured to exchange data with communicable equipment such as various information terminals via, e.g., the communication network N, a hard drive as an auxiliary storage device, an input device, and an output device.

The hard drive functions as a storage unit, and is configured to store a database of various types of information. The data stored in the hard drive includes various programs installed in advance to operate the subject device 1 and cause the subject device 1 to function as the medical assistance device. These programs are read and executed by the CPU, and in this manner, the functions of the medical assistance device are fulfilled.

[0044]

FIG. 4 is a diagram of the configuration of the subject device 1 in terms of function.

The configuration of the subject device 1 will be described again in terms of function. As illustrated in FIG. 4, the subject device 1 has, as main components, a health information acquiring unit 11, a score calculation unit 12, a common language conversion unit 13, an admission necessity determination unit 14, a result display unit 15, a transportation time prediction unit 16, a road traffic information acquiring unit 17, and a history information storage unit 18. These units play a role in various types of data processing executed by the subject device 1, and are implemented in such a manner that the above-described hardware configuration equipment forming the subject device 1 and the installed programs cooperate with each other. Hereinafter, each functional unit will be separately described.

[0045]

The health information acquiring unit 11 is implemented in such a manner that the CPU, the memory, the communication interface, the input device, etc. of the subject device 1 cooperate with the various programs. The health information acquiring unit 11 is configured to perform the health information acquiring processing of acquiring health

information transmitted from the caregiver terminal 3 and indicating the health condition of the care receiver. Specifically, data input from the caregiver terminal 3 by the caregiver is received and acquired via the communication network N.

The health information described herein is data input via, e.g., the keyboard or audio, and is information comprehensively including contents necessary for determining the health condition of the care receiver, such as numerical data including a body temperature, a blood pressure, a blood sugar level, and a SpO2 and symptoms including a dehydration symptom, a meal size, vomiting, and diarrhea. Moreover, the health information also includes text data or audio data such as muttering as a result of observation or recognizing of the caregiver, or a keyword extracted from the text data or the audio data. Note that the numerical data such as the body temperature, the blood pressure, the blood sugar level, and the SpO2 may be automatically forwarded on a regular basis from an automated measuring instrument such as a wearable biometer worn by the care receiver.

[0046]

The score calculation unit 12 is implemented in such a manner that the CPU, the memory, the hard drive, etc. of the subject device 1 cooperate with the various programs. The score calculation unit 12 provides, together with the common language conversion unit 13 and the admission necessity determination unit 14 as described later, a core function of the subject device 1. The score calculation unit 12 is configured to perform the score calculation processing of scoring, as a numerical value, the health information data acquired by the health information acquiring unit 11 according to preset evaluation items, thereby calculating a score indicating the health condition of the care

receiver.

In the present embodiment, for quickly grasping the health condition of the care receiver, major items, minor items obtained by subdivision of the major items, and muttering items are set as the evaluation items, and scoring is automatically performed for each item (a first assessment logic). At this point, the score for each evaluation item is weighted. For example, a higher rate of score is set for the evaluation items directly linked to a life, such as a consciousness condition, a respiratory condition, and a circulatory condition.

[0047]

One example of the evaluation items in the present embodiment will be specifically described herein.

FIG. 5 is a table of one example of the major items of the evaluation items, and FIG. 6 is a table of one example of the muttering items of the evaluation items.

[0048]

As illustrated in FIG. 5, 12 items for the health condition of the care receiver are set as the major items in the present embodiment, and a score of 1.0 to 5.1 is assigned considering a symptom from mild to severe. That is, an item for a mild symptom is scored as 1.0, and the rate of score gradually increases for items more deeply relating to the life. Moreover, each item is divided into categories such as the consciousness condition, the respiratory condition, and the circulatory condition. Further, each item is categorized into items taking observation of the caregiver into consideration, numerical items, and items recognizable by anyone.

Specifically, 12 items are set as the major items, the 12 items including 1. DEHYDRATION SYMPTOM (1.0, the consciousness condition), 2. MEAL SIZE DECREASE (1.0, the consciousness condition), 3. URINARY VOLUME DECREASE (NUMBER

OF TIMES) (1.0, the circulatory condition), 4. VOMITING (1.0, the consciousness condition), 5. DIARRHEA (1.0, the consciousness condition), 6. ABNORMAL BLOOD SUGAR (2.1, the consciousness condition), 7. FEVER OF EQUAL TO OR HIGHER THAN 38 DEGREES (2.1, the consciousness condition), 8. SpO2 OF EQUAL TO OR LOWER THAN 90% (3.1, the respiratory condition), 9. BLOOD PRESSURE OF EQUAL TO OR LOWER THAN 90 (3.1, the circulatory condition), 10. MELENA/BLOOD VOMITING (4.1, the circulatory condition), 11. DISTURBED CONSCIOUSNESS (5.1, the consciousness condition), and 12. SINGLE VOMITING EVENT + SpO2 OF EQUAL TO OR LOWER THAN 90% (5.1, the consciousness condition + the respiratory condition).

[0049]

Further, in the present embodiment, the minor items for fine scoring according to the degree of severity are set as necessary in association with the above-described major items.

Specifically, for 1. DEHYDRATION SYMPTOM, the minor items include a. WATER INTAKE DECREASE and b. MEAL SIZE DECREASE. It is set such that 0 is added in a case corresponding to one of a. or b. and 1.0 is added in a case corresponding to both of a. and b. at the same moment. For 6. ABNORMAL BLOOD SUGAR, it is set such that a. EQUAL TO OR LOWER THAN 80: 1, b. EQUAL TO OR LOWER THAN 70: 2, c. EQUAL TO OR HIGHER THAN 400: 2, or d. EQUAL TO OR HIGHER THAN 500: 3 is added as the minor item. For 7. FEVER OF EQUAL TO OR HIGHER THAN 38 DEGREES, it is set such that a. EQUAL TO OR HIGHER THAN 39 DEGREES: 1 is added as the minor item. For 8. SpO2 OF EQUAL TO OR LOWER THAN 90%, it is set such that a. 85% TO 89%: 0 or b. 80% TO 84%: 1 is added as the minor item. When 9. BLOOD PRESSURE OF EQUAL TO OR LOWER THAN 90 is checked, it is set such that a. 80 TO 99: 0, b. 70 TO 79: 1, c. EQUAL TO OR HIGHER THAN 180: 0, or d. EQUAL TO OR HIGHER THAN 200: 1 is added as the minor item. On the other

hand, no minor items are specifically set for 2. MEAL SIZE DECREASE, 3. URINARY VOLUME DECREASE (NUMBER OF TIMES), 4. VOMITING, 5. DIARRHEA, 10. MELENA/BLOOD VOMITING, and 12. SINGLE VOMITING EVENT + SpO2 OF EQUAL TO OR LOWER THAN 90%.

5 Note that the above-described minor items are examples, and might be changed as necessary, for example.
[0050]

10 As illustrated in FIG. 6, predetermined keywords are set in advance. It is set such that in a case where the text data or the audio data such as muttering of the caregiver includes a corresponding keyword, such a keyword is picked up and a score of 1 is added. Note that it is set such that in a case where the same keyword is found multiple times, such a keyword is automatically omitted.

15 For example, for the muttering items, words necessary for other types of medical care are set as necessary as the keywords, the words including "SLIGHT PULMONARY SOUND OBSERVED," "CONDITION DETERIORATED," "FEVER ONSET UPON CALLING," "VOMITING DURING NIGHT," "PHLEGM IN THROAT," "TREATMENT WITH
20 ANTIPYRETIC DURING NIGHT," "LOWER EXTREMITY EDEMA," "GREAT VOMITING," "UNDIGESTED FOOD VOMITING," "INSTRUCTION FOR DRIP OR ANTIBIOTIC INFUSION," "SUSPICION OF ASPIRATION PNEUMONITIS," "AWAKENING FAILURE," "SMALL WATER INTAKE," "LIFELESS," "ABDOMINAL PAIN," "CLOUDINESS OF URINE," and "CONCERNS OF
25 CAREGIVER."

 Note that the above-described keywords are examples, and the present invention is not limited to above. For example, the present system is continuously operated so that the keywords can be added/accumulated. Moreover, not a flat score but a fine
30 score can be set for each keyword.
[0051]

 The common language conversion unit 13 is implemented in

such a manner that the CPU, the memory, the hard drive, etc. of the subject device 1 cooperate with the various programs. The common language conversion unit 13 provides, together with the score calculation unit 12 and the later-described admission necessity determination unit 14, the core function of the subject device 1. The common language conversion unit 13 is configured to perform the common language conversion processing of converting the score calculated by the score calculation unit 12 and indicating the health condition of the care receiver into a common language commonly recognizable as an indicator for the health condition by both of the caregiver and the medical profession.

[0052]

FIG. 7 is a table of one example of the common language.

As illustrated in FIG. 7, in the present embodiment, a weather forecast expression figuratively expressing the health condition as in weather is used as the common language as the technique of linking the nursing care and the medical care to each other so that everyone can easily understand the language without relying on technical terms. A score range is provided to each of seven categories so that the health condition can be directly understood at the mere mention of words by means of the weather forecast expression. According to the score calculated by the score calculation processing, the health condition of the care receiver is assigned to any of these seven categories.

Specifically, it is set such that the case of 0 is "FINE HEALTH," the case of 0.1 to 1.0 is "PARTLY-CLOUDY HEALTH," the case of 1.1 to 2.0 is "CLOUDY HEALTH," the case of 2.1 to 3.0 is "CLOUDY-TURNING-TO-RAIN HEALTH," the case of 3.1 to 4.0 is "LIGHT-RAIN HEALTH," the case of 4.1 to 5.0 is "HEAVY-RAIN HEALTH," and the case of equal to or higher than 5.1 is

"HEAVY-RAIN-AND-THUNDER HEALTH."

Moreover, coping strategies etc. are also set for each weather forecast expression. For example, in the case of the "FINE HEALTH" and the "PARTLY-CLOUDY HEALTH," a wait-and-see approach is taken. Further, in the case of the "PARTLY-CLOUDY HEALTH," the care receiver is admitted to the hospital when such a condition is continued for the number of days (three days) for determining the progress. In the case of the "CLOUDY HEALTH," the wait-and-see approach is taken and the home visit is requested. When such a condition is continued for the number of days (two days) for determining the progress, the care receiver is admitted to the hospital. In the case of the "CLOUDY-TURNING-TO-RAIN HEALTH," the home visit is requested, and oral medication is administered. When such a condition is not recovered within the number of days (two days) for determining the progress, the care receiver is admitted to the hospital. In the case of the "LIGHT-RAIN HEALTH," strict observation is taken, and a report is made again on the following day. When such a condition is not recovered within the number of days (one day) for determining the progress, the care receiver is admitted to the hospital. In the case of the "HEAVY-RAIN HEALTH," the care receiver is admitted to the hospital in 24 hours by an elder-care taxi etc. In the case of the "HEAVY-RAIN-AND-THUNDER HEALTH," the care receiver is immediately admitted to the hospital by an ambulance.

[0053]

The admission necessity determination unit 14 is implemented in such a manner that the CPU, the memory, the hard drive, etc. of the subject device 1 cooperate with the various programs. The admission necessity determination unit 14 provides, together with the score calculation unit 12 and the common language conversion unit 13, the core function of the

subject device 1. The admission necessity determination unit 14 is configured to perform the admission necessity determination processing of comparing the score indicating the health condition of the care receiver as calculated by the score calculation unit 12 with a preset predetermined reference value, thereby determining as admission required when the score is equal to or greater than the reference value.

[0054]

In the present embodiment, it is determined whether or not the total of scores calculated from the input contents of the major items, the minor items, and the muttering items exceeds a score set in advance as a reference value for a case determined as admission required (a second assessment logic).

For example, a total score of 2.1 corresponds to the "CLOUDY-TURNING-TO-RAIN HEALTH" according to the common language. Thus, it is determined that no admission is required, and a home visit request is prompted and treatment is provided with, e.g., the oral medication. Note that even in this case, a temporal change is also grasped, and when such a condition is not recovered even after a lapse of two days, it is determined as admission required. On the other hand, a total score of 4.1 corresponds to the "HEAVY-RAIN HEALTH" according to the common language, and it is determined as admission required. Thus, the care receiver is admitted to the hospital in 24 hours.

[0055]

Moreover, in the admission necessity determination processing, determination is not only simply made according to the score, but also the admission necessity is comprehensively determined according to determination factors including attributes such as the age of the care receiver, a previous medical history, and a variation amount from a previous health condition in history information data 18a stored in the

later-described history information storage unit 18.

Point addition is made according to the age, and for example, 1 is added for an age of 80 to 89 and 2 are added for an age of 90 or more. Although the score itself exceeds the reference value, in a case where the care receiver is still young or a case where the variation amount from a numerical value indicating the previous health condition is small, i.e., almost no change from a usual physical condition is observed, determination as admission required is not made without exception, and the admission necessity is comprehensively determined considering an individual situation for each care receiver, such as attributes and a temporal change.

[0056]

Note that for health management for the elderly person, the symptom sometimes suddenly gets worse due to fever onset/the respiratory condition/a dietary condition. Thus, in the present embodiment, an attempt is made to quickly find the symptom and link such a symptom to admission for health management. For example, according to the guideline for management of community-acquired pneumonia in adults, criteria for admission are determined according to ADROP. That is, the criteria for determination on admission is Age, Dehydration, Respiration, disOrientation, and Blood Pressure. Moreover, criteria for determination on admission due to urinary tract infection include a fever of equal to or higher than 38 degrees and poorly-controlled blood sugar.

Determination on the admission necessity in the present embodiment is also made according to the above-described criteria.

[0057]

The result display unit 15 is implemented in such a manner that the CPU, the memory, the communication interface, the hard

drive, the output device, etc. of the subject device 1 cooperate with the various programs. The result display unit 15 is configured to perform the result display processing of displaying, on the medical profession terminal 2 and the caregiver terminal 3, the score calculated by the score calculation unit 12, the common language converted by the common language conversion unit 13, an admission necessity determination result determined by the admission necessity determination unit 14, transportation time predicted by the later-described transportation time prediction unit 16, and arrival time, for example.

For example, for visual checking by both of the caregiver and the medical profession, not only the attributes such as a name, age, and sexuality but also the score for each item, the total (score total) of these scores, the weather forecast expression as the common language for figuratively expressing the health condition as in weather, and action to be subsequently taken by the care receiver, i.e., the admission necessity, are displayed for each care receiver in the form of a report or a list, for example.

Moreover, a region or a nursing care facility etc. in which the care receiver is present and the health condition of such a care receiver are displayed on a map, for example. Specifically, the weather forecast expression as the common language is used to display, e.g., a sunny mark or a rainy mark on the map as a weather map showing the health condition of the care receiver. Further, for the care receiver needing to be admitted to the hospital, the transportation time from a current position such as the nursing care facility to the medical institution and the arrival time at the medical institution are displayed on the map. At this point, a transportation route may be displayed.

[0058]

The transportation time prediction unit 16 is implemented in such a manner that the CPU, the memory, the hard drive, etc. of the subject device 1 cooperate with the various programs. The transportation time prediction unit 16 is configured to perform the transportation time prediction processing of predicting the transportation time to the medical institution as an admission destination for the care receiver determined as admission required.

Specifically, information regarding traffic jams or restriction obtained from road traffic information acquired by the later-described road traffic information acquiring unit 17 is added to a distance or a route from current position information such as the nursing care facility in which the care receiver is present to the medical institution as the admission destination, and the transportation time from the nursing care facility etc. to the medical institution is calculated. At this point, a transportation route shortest in terms of time is also searched considering, e.g., congestion.

[0059]

The road traffic information acquiring unit 17 is implemented in such a manner that the CPU, the memory, the communication interface, the input device, etc. of the subject device 1 cooperate with the various programs. The road traffic information acquiring unit 17 is configured to perform the road traffic information acquiring processing of acquiring, from an external database, the road traffic information indicating the traffic jams or restriction.

Specifically, real-time road traffic information accumulated in the not-shown external database or delivered from the external database, such as an expected traffic jam, current traffic jam information, lane restriction, closure, and

traffic restriction, is acquired via the communication network N.

[0060]

5 The history information storage unit 18 is implemented in such a manner that the CPU, the memory, the hard drive, etc. of the subject device 1 cooperate with the various programs. The history information storage unit 18 is configured to store and accumulate, as the history information data 18a, various types of information including the health information acquired
10 from the caregiver terminal 3 by the health information acquiring unit 11 and indicating the health condition of the care receiver.

The history information data 18a includes information for identifying the care receiver, such as a code number,
15 information indicating the attributes such as the name, age, birthday, sexuality, and address of the care receiver, and information indicating the medical history and health condition of the care receiver in association with reporting date, for example.

20 [0061]

Moreover, the history information storage unit 18 is configured to store, as a previous actual case, the score upon determination as admission required and the actual number of days for staying in the hospital in association with each other
25 for each care receiver and to store such accumulated information as statistical data 18b statistically indicating a length pattern associated with the actual number of days in the hospital corresponding to the score upon determination as admission required.

30 [0062]

Note that the medical institution managing and operating the subject device 1 and the nursing care facility etc. enjoy

the functions of the subject device 1, but the method for providing the functions to a user may be a method such as a cloud service or an ASP.

Moreover, the subject device 1 is not limited to one built by a single server device, and may be built using multiple server devices.

[0063]

<Medical Assistance Method according to Present Embodiment>

Next, a medical assistance method according to the present embodiment will be described.

The medical assistance method according to the present embodiment is implemented using the subject device 1 functioning as the computer. In other words, in medical assistance processing executed by the subject device 1, the medical assistance method according to the present embodiment is applied.

Hereinafter, the flow of processing by the subject device 1 and each step during such processing will be described as description of the medical assistance method according to the present embodiment.

[0064]

(1) Medical Assistance Processing

FIG. 8 is a flowchart of the flow of the medical assistance processing.

The medical assistance processing executed by the computer forming the subject device 1 advances according to the flow of FIG. 8.

[0065]

First, the health information acquiring processing is executed by the health information acquiring unit 11 (S101).

Specifically, the health information acquiring unit 11

receives and acquires, via the communication network N, the health information input from the caregiver terminal 3 and indicating the health condition of the care receiver.

[0066]

5 Next, the score calculation unit 12 executes the score calculation processing (S102) of scoring, as the numerical value, the health information acquired by the health information acquiring processing (S101) according to the preset evaluation items, thereby calculating the score indicating the
10 health condition of the care receiver.

 Specifically, based on the first assessment logic, the acquired health information is scored for each of the above-described major items, the above-described minor items, and the above-described muttering items set in advance as the
15 evaluation items, and the score for each item and the total of these scores are calculated.

[0067]

 A specific example of the score calculation processing based on the first assessment logic will be described with
20 reference to FIG. 9.

 FIG. 9 is a flowchart of the flow of the score calculation processing. FIG. 10 is a table of one example of the muttering evaluation items referred in the score calculation processing.

 Note that a case where, e.g., text data of muttering as
25 a result of observation or recognizing of the caregiver is acquired in the above-described health information acquiring processing will be described herein as one example.

[0068]

 In the score calculation processing, when a muttering
30 character string, i.e., the text data of muttering as a result of observation or recognizing of the caregiver, is received in the above-described health information acquiring processing

(S201), the entirety of such data is read from a muttering evaluation master as a check item master in which the muttering evaluation items are listed as illustrated in FIG. 10 (S202).

As illustrated in FIG. 10, the muttering evaluation items are each defined for states 1 to n (e.g., n = 15). A text data character string indicating each state is defined with the string being divided into the first half and the second half, and these portions are combined to indicate a single state.

For example, in the state 1, "RESPIRATION," "BREATH," "VOICE," ... etc. are defined for the former character string, and "SOUND IS," "NOISE," "RATTLING," "DIFFERENT THAN USUAL," "KARETE (hoarse in hiragana)," "HOARSE," ... etc. are defined for the latter character string. Moreover, in the state 2, "GRADUALLY," "BIT BY BIT," "MORE," "LITTLE," "LITTLE BY LITTLE," "A LITTLE BIT AT A TIME," "FACIAL COLOR IS," ... etc. are defined for the former character string, and "BAD," "WARU (bad in hiragana)," "HARD," "KURU (hard in hiragana)," "HARD TO BREATHE," "YOKUNA (unfavorable in hiragana)," "UNFAVORABLE," ... etc. are defined for the latter character string. In this case, although having the same meaning, the keywords of the character string can be adapted to various muttering writing or expression methods by the caregiver, such as Chinese characters, hiragana, katakana, and the presence or absence of characters added after Chinese characters.

[0069]

After the entirety of the data has been read from the evaluation master, matching processing is performed n times (the states 1 to n) in the present embodiment.

First, for checking the former character string, it is determined whether or not the former character string in an array is blank (S203). In the case of the blank character string (S203: Yes), it is determined whether or not the matching

processing has been performed n times (S204). In a case where the matching processing has been already performed n times (S204: Yes), the processing ends as a loop end. In a case where the matching processing is not performed n times yet (S204: No),
5 the former character string is repeatedly checked until the end of the n-th processing.

On the other hand, in a case where the former character string in the array is not blank (S203: No), it is determined whether or not the former character string is present in the
10 muttering character string (S205). In a case where the former character string is present (S205: Yes), the processing of taking a portion from the beginning of the muttering character string to before the former character string as a single character string A and taking a portion from after the former
15 character string to the end of the muttering character string as a character string B is performed (S206).

Subsequently, for checking the latter character string, it is determined whether or not the latter character string in the array is blank (S207). In the case of the blank character
20 string (S207: Yes), the processing returns to checking of the former character string. In a case where the latter character string in the array is not blank (S207: No), it is determined whether or not the latter character string is present in the character strings A and B (S208). In a case where the latter
25 character string is present (S208: Yes), it is continuously determined whether or not the position of the latter character string is within 10 characters from a first character (S209). In a case where the position is within 10 characters (S209: Yes), the state 1 and state evaluation of the check item master are
30 obtained as return values (S210). If fever onset and vomiting have been already checked, it is, after the processing of excluding fever onset and vomiting (S211), whether or not the

matching processing has been performed n times (S212). In a case where the matching processing has been already performed n times (S212: Yes), the processing ends as a loop end. In a case where the matching processing is not performed n times yet
5 (S212: No), the former character string is repeatedly checked until the end of the n-th processing.

[0070]

Returning to description of the entirety of the medical assistance processing of FIG. 8, the common language conversion
10 unit 13 subsequently executes the common language conversion processing of converting the total score calculated by the score calculation processing (S102) into the common language commonly recognizable as the indicator for the health condition by both of the caregiver and the medical profession (S103).

15 Specifically, as illustrated in FIG. 7, the weather forecast expression figuratively expressing the health condition as in weather and divided into the seven categories is taken as the common language, and the health condition of the care receiver is assigned to any of the seven categories
20 according to the total score. In this manner, the total score is converted into the common language.

[0071]

Next, the admission necessity determination unit 14 executes the admission necessity determination processing of
25 comparing the total score calculated by the score calculation processing (S102) with the preset predetermined reference value, thereby determining that the care receiver needs to be admitted to the hospital (admission required) when the total score is equal to or greater than the reference value (S104).

30 Specifically, the total score is compared with the score as the reference value based on the second assessment logic. At this point, the history information regarding a

corresponding care receiver is read from the history information storage unit 18, and according to the determination factors including the attributes such as the age of the care receiver, the previous medical history, and the variation amount from the previous health condition in the history information, the admission necessity is determined comprehensively.

[0072]

A specific example of the admission necessity determination processing based on the second assessment logic will be described with reference to FIG. 11.

FIG. 11 is a flowchart of the flow of the admission necessity determination processing. FIG. 12 is a schematic chart of a relationship between a change in the total score and an admission pattern.

[0073]

In the admission necessity determination processing, after total score data for the last n days (in the present embodiment, four days) regarding the individual health condition calculated in the above-described score calculation processing has been acquired, the entirety of such data is read from a determination master indicating a relationship between the total score and the common language as illustrated in FIG. 7 (S301).

Then, the processing of comparing the four total scores (the total scores for four days) and data in the determination master is performed in reverse chronological order. First, it is determined whether or not the total score is equal to or higher than 4.1 (S302). When the total score is equal to or higher than 4.1 (S302: Yes), e-mail notification is performed (S303), an admission comment indicating that admission is required is output to, e.g., an admission determination field (S304), and

e.g., a coping strategy comment of "PLEASE DO ... " is output to, e.g., a warning label field (S305).

When the total score is not equal to or higher than 4.1 (S302: No), it is subsequently determined whether or not the total score for today is equal to or higher than 3.1 and the total score for yesterday is equal to or higher than 0.1 (S306). When the above-described condition is met (S306: Yes), e-mail notification is performed (S303), the admission comment indicating that admission is required is output to, e.g., the admission determination field (S304), and e.g., the coping strategy comment of "PLEASE DO ... " is output to, e.g., the warning label field (S305).

When the above-described condition is not met (S306: No), it is subsequently determined whether or not the total scores for today, yesterday, and the day before yesterday are equal to or higher than 1.1 (S307). When the above-described condition is met (S307: Yes), e-mail notification is performed (S303), the admission comment indicating that admission is required is output to, e.g., the admission determination field (S304), and e.g., the coping strategy comment of "PLEASE DO ... " is output to, e.g., the warning label field (S305).

When the above-described condition is not met (S307: No), it is subsequently determined whether or not all of the four total scores are equal to or higher than 0.1 (S308). When the above-described condition is met (S308: Yes), e-mail notification is performed (S303), the admission comment indicating that admission is required is output to, e.g., the admission determination field (S304), and, e.g., the coping strategy comment of "PLEASE DO ... " is output to, e.g., the warning label field (S305).

On the other hand, when the above-described condition is not met (S308: No), it is finally determined whether or not the

total score for today is equal to or higher than 0.1 (S309).
When the total score for today is equal to or higher than 0.1
(S309: Yes), e.g., the coping strategy comment of "PLEASE DO ...
" is output to, e.g., the admission determination field (S310).
5 When the total score for today is not equal to or higher than
0.1 (S309: No), the processing ends.
[0074]

As illustrated in FIG. 12, in the present embodiment, even
in a case where one total score does not reach, for example,
10 a level corresponding to immediate admission, comprehensive
determination can be made from the health condition of the care
receiver for several days through multiple executions of
checking. Thus, the health condition of the care receiver can
be more accurately determined, and therefore, perfect admission
15 timing is not misjudged.
[0075]

Note that in the present embodiment, the admission
necessity determination processing (S104) is executed after the
common language conversion processing (S103). However, the
20 admission necessity determination processing (S104) may be
executed before the common language conversion processing
(S103), or these types of processing may be performed at the
same time.
[0076]

25 As a result of the admission necessity determination
processing (S104), in a case where determination as admission
required is made (S105: Yes), the transportation time
prediction unit 16 executes the transportation time prediction
processing of predicting the transportation time from the
30 current position such as the nursing care facility in which the
care receiver is present to the medical institution as the
admission destination (S106).

Specifically, the information regarding the traffic jams or restriction obtained from the road traffic information acquired by the road traffic information acquiring unit 17 is added to the distance or the route from the nursing care facility etc. to the medical institution, and the transportation time from the nursing care facility etc. to the medical institution is calculated. At this point, the transportation route shortest in terms of time is also searched considering, e.g., congestion.

10 [0077]

Then, the result display unit 15 executes the result display processing (S107) of displaying, on the medical profession terminal 2 and the caregiver terminal 3, the score for each item and the total of these scores as calculated by the score calculation processing (S102), the weather forecast expression as the common language converted by the common language conversion processing (S103), the admission necessity determined by the admission necessity determination processing (S104), and the transportation time predicted by the transportation time prediction processing (S106). Then, the processing ends.

Specifically, the above-described contents in the form of the report or the list are, together with position information on the nursing care facility etc., displayed on the map.

25 [0078]

On the other hand, as a result of the admission necessity determination processing (S104), in a case where determination as admission not required is made (S105: No), the result display unit 15 executes the result display processing (S107) of displaying, on the medical profession terminal 2 and the caregiver terminal 3, other contents than the transportation

time, i.e., the score for each item and the total of these scores as calculated by the score calculation processing (S102), the weather forecast expression as the common language converted by the common language conversion processing (S103), and the admission necessity determined by the admission necessity determination processing (S104). Then, the processing ends. [0079]

(2) Method for Utilizing Medical Assistance System

Next, one example of the method for utilizing the medical assistance system S including the subject device 1 configured to execute the above-described processing will be described with reference to a specific case.

FIG. 13 is a conceptual diagram of a service flow in the nursing care facility and the medical institution utilizing the medical assistance system S in association with each other, the diagram illustrating the flow in a case where the care receiver needing to be admitted to the hospital is present. FIG. 14 is a view of one example of the weather map indicating the health condition of the care receiver. FIG. 15 is a table of one example of a care receiver list before input of the health information. FIG. 16 is a table of one example of each descriptive text in a speech bubble. FIG. 17 is a table of one example of the care receiver list after results have been displayed. FIG. 18 is a view of one example of the weather map indicating the health condition of the care receiver.

[0080]

As illustrated in FIG. 13, the nursing care facility etc. including the caregiver terminal 3 to be operated by the caregiver and the medical institution including the medical profession terminal 2 to be operated by the medical profession enjoy the functions of the medical assistance system S of the present embodiment.

Note that the caregiver of the nursing care facility etc. and the medical profession of the medical institution, specifically a responsible person such as a leader or a doctor, hold mobile phones/PHSs, and are constantly in a reachable state.

[0081]

First, when the medical assistance system S is activated in the caregiver terminal 3 or the medical profession terminal 2, the medical assistance system S displays, as an opening screen, the position information on each nursing care facility etc. and the medical institutions within a predetermined area as illustrated in FIG. 14 on the map at the caregiver terminal 3 and the medical profession terminal 2.

The medical assistance system S may be automatically activated when the voice of the caregiver is input to the caregiver terminal 3 via the audio input device 4. Alternatively, the medical assistance system S can be automatically activated using, e.g., a nurse call by the care receiver as a trigger.

[0082]

Note that the nursing care facilities etc. and the medical institutions displayed herein are the nursing care facilities etc. and the medical institutions adapting the medical assistance system S and cooperating with each other according to the present embodiment for cooperation. However, as long as the nursing care facilities etc. and the medical institutions are present within the predetermined area, such adapting is not specifically limited exclusively. In the case of the nursing care at home, the position information on the home, such as "HOME OF MR./MS. XX," is displayed on the map.

Specifically, when the care receiver receiving the nursing care at home is registered to the medical assistance

system S for the medical service, even if the medical institution side does not recognize and register such an individual, a system administrator such as an executive office obtains information from the medical assistance system S, and transmits the information to the medical institution side. In this manner, even the care receiver not staying in, e.g., a specific nursing care facility can participate in the community-based integrated system in which the nursing care and the medical care cooperate with each other.

10 [0083]

For example, by clicking, the caregiver of the nursing care facility etc. specifies, on the map, the nursing care facility etc. to which the caregiver belongs to. In this manner, the caregiver views and checks the information on the care receivers belonging to such a nursing care facility etc.

Specifically, a screen of the list (a resident condition report list) of the information on the care receivers as illustrated in FIG. 15 is displayed on the screen of the caregiver terminal 3. Thus, the caregiver views such a screen for checking.

The information on the care receivers displayed in the resident condition report list may be displayed in descending order of inferiority of the numerical value, i.e., in ascending order of the quality of the health condition. At this point, when there is no numerical data for today, the numerical data for yesterday may be displayed in descending order of inferiority. Specifically for the care receiver with an unfavorable health condition, the numerical data etc. for multiple days from several days ago to today may be displayed so that the progress can be grasped at one view.

[0084]

At a scheduled time (e.g., at 10 a.m. every morning) every

day, the caregiver inputs, to the resident condition report list, the health conditions of the care receivers for which the caregiver is responsible for.

Specifically, in a case where there is a content
5 corresponding to each of the major items specified in advance for a symptom field of the resident condition report list of FIG. 15, such an item is selected as necessary by, e.g., clicking. These major items are for specifically describing contents necessary for a medical profession side for determining the
10 health conditions of the care receivers. Moreover, the minor items are set as necessary for the major items. In a case where there is a content corresponding to each minor item, such an item is selected as necessary by, e.g., clicking. For example, when a field below the major item is clicked, a pop-up mark
15 indicating the minor items is displayed so that a corresponding one of the minor items can be selected. Further, a comment such as a point the caregiver has noticed is directly input to, e.g., a remark field or a not-shown muttering item field.

An input method may be an input method via the keyboard
20 or an audio input method via the audio input devices 4 such as the microphone. Alternatively, it may be configured for some of the major items such as the SpO2, the blood pressure, the fever, the blood sugar, and the urinary volume that numerical values are, at the fixed time, automatically forwarded from the
25 automated measuring instrument such as the wearable biometer worn by the care receiver and are automatically input to the resident condition report list.

Note that in the resident condition report list, a pop-up function is added to fields such as a facility name, a reporter
30 name, and a job category, and therefore, the facility name, the reporter name, the job category, etc. can be easily selected. Moreover, in a date field, today's date is displayed in

cooperation with the computer.

[0085]

On the screen, messages for assisting the caregiver as illustrated as examples in FIG. 16 are displayed as descriptive texts in speech bubbles. For example, a descriptive text indicating an operation method, such as "PLEASE SELECT RIGHT ITEM AND PRESS [EXECUTE] BUTTON" and descriptive texts indicating, e.g., a point needing to be paid attention for each item and a point needing to be intensively checked, such as "DID YOU GET NO RESPONSE WHEN YOU HAVE SPOKEN TO HIM/HER, OR WAS HE/SHE UNABLE TO ACCURATELY UNDERSTAND SURROUNDING SITUATION?" and "DID HE/SHE EAT LESS THAN USUAL EVEN THOUGH HE/SHE DID NOT EAT UNFAVORITE FOOD?" are displayed.

[0086]

When the health conditions of the care receivers are input by the caregiver terminal 3, the medical assistance system S scores, based on the above-described first assessment logic, the acquired health information for each of the above-described major items, the above-described minor items, and the above-described muttering items set in advance as the evaluation items, thereby calculating the score for each item and the total of these scores.

Then, such a total score is converted into the common language commonly recognizable as the indicator for the health condition by both of the caregiver and the medical profession. In the present embodiment, the weather forecast expression figuratively expressing the health condition as in weather and divided into the seven categories is taken as the common language. According to the total score, the health condition of the care receiver is assigned to any of the seven categories, and in this manner, the total score is converted into the common language.

[0087]

The medical assistance system S displays, on the caregiver terminal 3 and the medical profession terminal 2, the score for each item and the total of these scores by calculation described above and the weather forecast expression converted from the total score.

Specifically, the resident condition report list reflecting scores and weather forecast as illustrated in FIG. 17 is produced and displayed. For example, Ms. Hanako Tokyo (the care receiver) corresponds to the dehydration symptom, a fever of equal to or higher than 38.1 degrees, poor appetite, and vomiting, and therefore, the score added for each item and a score of "5.1" as the total of these scores are displayed. Moreover, the "HEAVY-RAIN-AND-THUNDER HEALTH" corresponding to such a total score is displayed as the weather forecast as the common language.

As illustrated in FIG. 18, the weather map is also displayed on the map displaying the position information on each nursing care facilities etc. and the medical institutions present within the predetermined area. For example, in a case where Ms. Hanako Tokyo at a YY nursing care center corresponds to the "HEAVY-RAIN-AND-THUNDER HEALTH," a weather mark indicating the "HEAVY-RAIN-AND-THUNDER HEALTH" and information on Ms. Hanako Tokyo are displayed at the position of the YY nursing care center on the map. When such a weather mark is, for example, clicked on the caregiver terminal 3 or the medical profession terminal 2, medical necessity including the necessity of an ambulance call and determination on hospital visit or hospital stay can be checked.

[0088]

The resident condition report list and the weather map as described above are displayed on the caregiver terminal 3,

and therefore, the caregiver checks these displayed contents.
For example, in a case where there is a person needing to be
checked, such as Ms. Hanako Tokyo, such a person is highlighted,
and therefore, the risk of overlooking by the caregiver is
5 reduced.

Note that conversion into the common language is actually
performed immediately after the score has been calculated.
Thus, the caregiver feels that the score is displayed at the
substantially same time as input.

10 [0089]

Meanwhile, similar information is also transmitted to the
medical profession terminal 2, and the resident condition
report list and the weather map are displayed. Thus, the
medical profession checks these displayed contents.

15 At this point, the resident condition report list may be
checked for each of the nursing care facilities etc. in
cooperation. However, the nursing care facility etc. with a
severe care receiver whose health condition has gotten worse
can be distinguished at one view on the weather map. Thus, it
20 is efficient that the corresponding nursing care facility etc.
are selected on the map by, e.g., clicking and detailed contents
thereof are checked. For example, the weather mark indicating
the "HEAVY-RAIN-AND-THUNDER HEALTH" is displayed at the
position of the YY nursing care center at which Ms. Hanako Tokyo
25 is present, and is notably displayed by, e.g., blinking. Thus,
the medical profession can preferentially select the YY nursing
care center by, e.g., clicking to display the information on
Ms. Hanako Tokyo. The information displayed at this point may
include a graph or a table of past progress over time based on
30 history information on Ms. Hanako Tokyo. For example, in a case
where there is the care receiver needing to be checked, such
as Ms. Hanako Tokyo, such a care receiver is highlighted, and

therefore, the risk of overlooking can be also reduced on the medical profession side.

Note that in a case where there is a care receiver assumed to have a high admission necessity, contact with a mobile phone/a PHS held by a responsible person such as a doctor or a person in charge among medical professions of the medical institution may be automatically made. Alternatively, it may be configured such that the degree of urgency is set for each item and emergency contact is made in the case of, e.g., the disturbed consciousness.

[0090]

Further, the medical assistance system S compares, based on the second assessment logic, the total score with the score as the reference value, thereby comprehensively making final determination on the admission necessity according to the determination factors including the attributes such as the age of the care receiver, the previous medical history, and the variation amount from the previous health condition. Then, the medical assistance system S predicts the transportation time from the current position such as the nursing care facility at which the care receiver is present to the medical institution as the admission destination.

Specifically, in the present embodiment, the scores as the reference values are set such that a point of equal to or higher than 4.1 corresponds to admission in 24 hours and a point of equal to or higher than 5.1 corresponds to immediate admission. For example, in the case of Ms. Hanako Tokyo, a total score of "5.1" and the reference value thereof are compared to each other while the previous health condition etc. are also taken into consideration, and it is determined that such a case corresponds to immediate admission. Considering the information on, e.g., the traffic jams or restriction from the

road traffic information, transportation time from the YY nursing care center at which Ms. Hanako Tokyo is present to a ZZ hospital is calculated. At this point, in a case where there are multiple medical institutions, the medical institution to which the care receiver can be transported at earliest is preferentially selected.

[0091]

The medical assistance system S displays a result of final determination described above on the caregiver terminal 3 and the medical profession terminal 2. At this point, the care receiver meeting the criteria for admission is highlighted on both of the resident condition report list and the weather map. Moreover, the transportation time from the nursing care facility etc. to the medical institution is also displayed.

Note that the weather forecast as the previously-displayed common language and information on the final determination result may be displayed at the same time.

[0092]

The medical institution side can easily check, at one view, the today's health conditions of the care receivers at all nursing care facilities etc. in cooperation by means of the weather marks displayed on the weather map displayed on the medical profession terminal 2. In a case where there is a care receiver needing to be admitted to the hospital, information such as "MS. HANAKO TOKYO: WEATHER FORECAST SCORE OF 5.1, 15 MINUTES TO ZZ HOSPITAL" is displayed together with the weather mark indicating the "HEAVY-RAIN-AND-THUNDER HEALTH" on the weather map. Thus, admission acceptance preparation such as reservation of a bed can be efficiently performed. Moreover, at this point, contact with the mobile phone/the PHS of the medical profession is made so that the admission acceptance preparation can be promptly made.

Note that regarding a patient desiring the end-of-life care, such a desire is displayed, and therefore, a suitable response is made.

[0093]

5 Meanwhile, on the side of the nursing care facility etc.,
a care receiver determination result and time required for
transportation to the medical institution can be checked by the
weather map displayed on the caregiver terminal 3. When a
decision on admission is added at this point, contact with, e.g.,
10 the mobile phone/the PHS held by the caregiver is made to provide
an instruction for starting admission preparation. Moreover,
the caregiver and the medical profession such as medical social
workers on both sides of the nursing care facility etc. and the
medical institution get in contact with each other to determine,
15 e.g., final arrival time. Then, on the nursing care facility
side, the caregiver gets in contact with the family of the care
receiver.

[0094]

At the caregiver terminal 3, a medical information
20 disclosure document production screen is displayed. Thus, the
caregiver produces a medical information disclosure document,
and then, transmits such a document to the medical institution.
At this point, the medical assistance system S may specify the
name of the care receiver needing to be admitted to the hospital
25 by, e.g., clicking, thereby automatically producing the medical
information disclosure document and transmitting the medical
information disclosure document to the medical institution.

On the medical institution side, the received medical
information disclosure document is viewed and checked on the
30 medical profession terminal 2, and a hospital medical record
is produced.

[0095]

Thereafter, on the side of the nursing care facility etc., arrangement for transportation by, e.g., the taxi or the ambulance is made. On the medical institution side, an admission procedure is performed as soon as the transported care receiver arrives. After all services have ended, the screens of both of the medical profession terminal 2 and the caregiver terminal 3 return to the opening screens, and the position information on each nursing care facility etc. and the medical institutions present within the predetermined area as illustrated in FIG. 14 is displayed on the map.

Note that in the present embodiment, discrimination is made such that admission in 24 hours is admission by means of the elder-care taxi etc. and immediate admission is admission by means of the ambulance.

[0096]

<Summary>

As described above, according to the present embodiment, the weather forecast technique is used as the common language for linking the medical care and the nursing care different from each other in expertise. The result (the health condition of the care receiver) scored according to such a certain rule that the major items, the minor items, and the muttering items are input is categorized into the seven categories, and is automatically assigned to the weather forecast expression. In this manner, the admission necessity is determined.

With this configuration, anyone can grasp, at one view, the health condition of the care receiver such as the nursing care facility etc. (regions) with the rainy weather without relying on the technical terms, and both of the caregiver and the medical profession can promptly and accurately grasp the health condition of the care receiver, and the admission necessity can be determined.

Thus, cooperation between the nursing care and the medical care can be promptly and accurately made, and the community-based integrated system in cooperation between the nursing care and the medical care can be suitably promoted. Moreover, the style of "SPENDING MOST OF ONE'S TIME AT HOME, BUT STAYING IN HOSPITAL ON OCCASIONAL BASIS" can be established from the position of the care receiver, and assistance can be provided such that the care receiver lives in one's own way with security.

10 [0097]

A reporting method focusing on a dialogue among the caregivers in a normal nursing care service can be employed, and everyone can carry out the same service with the same quality according to such a certain rule that each item is checked with a report from the caregiver being simplified as much as possible.

With this configuration, service standardization can be realized, and the amount of service by the caregiver having responsibility on one's own judgement and stress on such a caregiver can be reduced.

[0098]

The health condition (the symptom) is scored for each item, and the health condition of the care receiver is scored and is indicated in an objective and logical manner by the weather forecast expression. With this configuration, the score for each item for indicating the health condition of the care receiver and the weather forecast expression indicating the total score can be understood by anyone, an entire process until admission can be visualized, and a reason for admission determination can be grasped in an objective and logical manner by anyone.

Moreover, scoring is performed as described above so that

the caregiver can also share a feeling generated from doctor's experience linked to a diagnosis process or treatment constantly repeated in the head of the doctor. Meanwhile, muttering etc. of the caregiver is also scored so that the medical profession side can also share a feeling such as a slight change felt by the caregiver in a daily life.

In terms of improvement in the degree of staff satisfaction, the caregiver and the medical profession can logically understand the services performed by the caregiver and the medical profession, and an actual feeling of participating in health management of the care receiver can be provided to both of the caregiver and the medical profession. [0099]

The transportation time from the nursing care facility etc. to the medical institution as the admission destination is calculated using the road traffic information. Thus, time spent for admission preparation can be shortened, and overtime work of a nurse can be reduced.

[0100]

As described above, in the present embodiment, the medical assistance system configured so that the information on the care receiver can be shared between the caregiver and the medical profession and cooperation between the nursing care and the medical care can be realized has been described. However, the present embodiment is merely one example for easy understanding of the present invention, and is not intended to limit the present invention. That is, the present invention is not limited to the nursing care in the narrow sense. As long as the system shares the information on the person needing some sort of assistance between the person relating to the person needing some sort of assistance and the medical profession, the present invention can be applied to such a system.

Moreover, in the present embodiment, the care receiver at the nursing care facility etc. has been mainly described, but needless to say, use at each care receiver's home is also available. For example, a dedicated opening screen or an information input screen such as a screen for a nursing care facility or an elderly facility, a screen for a patient at home, a screen for a facility manager, a screen for a medical institution, and a screen for a superuser are prepared so that health management not only for various facilities but also for the patient at home can be suitably realized in response to telemedicine.

Further, in the present embodiment, a point addition method for determining the health condition of the care receiver is employed, but a point deduction method etc. may be employed.

[0101]

In the above-described embodiment, the medical assistance device includes the single computer. However, as long as the system can be implemented as a whole, each function may be dispersed.

That is, in the above-described embodiment, the health information acquiring unit 11, the score calculation unit 12, the common language conversion unit 13, the admission necessity determination unit 14, the result display unit 15, the transportation time prediction unit 16, the road traffic information acquiring unit 17, and the history information storage unit 18 are implemented by the single computer. Note that the present invention is not limited to above, and the medical assistance device may include multiple computers. For example, the score calculation unit 12 etc. may be provided on a caregiver terminal side.

[0102]

The medical assistance system of the present invention

is necessary for all nursing care facilities etc. and all medical institutions, and is core software for community-based integrated care system promotion. That is, the system is build, in which cooperation between the medical care and the nursing care can be promoted and local medical institutions can manage the health conditions of the care receivers such as the elderly persons in the nursing care facilities etc. Thus, the community-based integrated care system can be promoted. Specifically, according to the medical assistance system of the present invention, integration in a group can be realized for enhancing intensive health management for the care receiver such as the elderly person in each nursing care facility etc. and cooperation among each nursing care facility etc. and the medical institutions present within the predetermined area and realizing the community-based integrated care system.

For achieving primary balance until the fiscal year 2025 in a financial situation in Japan, even if an economic growth of 2% level is continued, improvement in annual balance by about 30 trillion yen needs to be made (e.g., corresponding to a tax rate of 25% in terms of consumption tax hike). For this reason, government spending only for the medical care and the nursing care due to aging of population is inevitably a key for fiscal health.

The medical assistance system of the present invention enhances an efficiency in a work-site for the medical care and the nursing care, covers for shortfall in human resources, and contributes to fiscal health of the Japanese government while holding high service quality. Thus, the medical assistance system is expected as a system essential for a society.

Moreover, needless to say, the medical assistance system of the present invention can be utilized at each country under aging societies, such as not only Japan but also Chine and Korea,

from a view of an aging society around the world.

REFERENCE SIGNS LIST

[0103]

- 5 1: subject device (medical assistance device)
- 2: medical profession terminal
- 3: caregiver terminal
- 4: audio input device
- 11: health information acquiring unit
- 10 12: score calculation unit
- 13: common language conversion unit
- 14: admission necessity determination unit
- 15: result display unit
- 16: transportation time prediction unit
- 15 17: road traffic information acquiring unit
- 18: history information storage unit
 - 18a: history information data
 - 18b: statistical data
- S: medical assistance system
- 20 N: communication network

CLAIMS

1. A medical assistance system for sharing, via a computer, information on a person needing assistance between a person
5 relating to the person needing the assistance and a medical profession, wherein

the computer includes

a health information acquiring unit configured to acquire health information indicating a health condition of the
10 person needing the assistance,

a score calculation unit configured to score, as a numerical value, the health information according to preset evaluation items of a medical institution, thereby calculating a score indicating the health condition of the person needing
15 the assistance,

a common language conversion unit configured to convert the score into a common language commonly recognizable as an indicator for the health condition by both of the person relating to the person needing the assistance and the medical
20 profession,

an admission necessity determination unit configured to determine as admission required when the score does not satisfy a predetermined requirement, and

a result display unit configured to display the
25 score or the common language.

2. The medical assistance system according to claim 1, wherein

the health information acquiring unit extracts a preset
30 predetermined keyword from text data input by the person relating to the person needing the assistance.

3. The medical assistance system according to claim 1,
wherein

the health information acquiring unit extracts a preset
predetermined keyword from audio data audio-input by the person
5 relating to the person needing the assistance.

4. The medical assistance system according to any one of
claims 1 to 3, wherein

the score calculation unit calculates the score for each
10 evaluation item at different score rates.

5. The medical assistance system according to any one of
claims 1 to 4, wherein

the result display unit displays an indication including
15 a content of an instruction for subsequent action for the person
needing the assistance.

6. The medical assistance system according to any one of
claims 1 to 5, wherein

20 the result display unit together displays, on a map, the
score or the common language and position information on the
person needing the assistance in a state in which admission
necessity is identifiable.

25 7. The medical assistance system according to any one of
claims 1 to 6, wherein

the common language is a character or a mark indicating
weather information for figuratively expressing the health
condition of the person needing the assistance as in weather.
30

8. The medical assistance system according to any one of
claims 1 to 7, wherein

the computer

further includes a history information storage unit configured to store, for each person needing assistance, history information indicating an attribute and a previous health condition of the person needing the assistance, and

the admission necessity determination unit determines the admission necessity according to the attribute and the history information as determination factors.

9. The medical assistance system according to claim 8, wherein

the history information storage unit stores information indicating the number of days for previous hospital stay of the person needing the assistance in association with the score or the common language upon admission.

10. The medical assistance system according to any one of claims 1 to 9, wherein

the computer further includes

a road traffic information acquiring unit configured to acquire road traffic information indicating a traffic jam or restriction, and

a transportation time prediction unit configured to predict transportation time to the medical institution according to an association between the position information on the person needing the assistance and determined as admission required and the road traffic information,

wherein the result display unit displays the transportation time of the person needing the assistance to the medical institution or arrival time of the person needing the assistance at the medical institution.

11. A medical assistance method for sharing, via a computer, information on a person needing assistance between a person relating to the person needing the assistance and a medical profession, wherein

5 the computer executes

 a health information acquiring processing of acquiring health information indicating a health condition of the person needing the assistance,

 a score calculation processing of scoring, as a
10 numerical value, the health information acquired by the health information acquiring processing according to preset evaluation items of a medical institution, thereby calculating a score indicating the health condition of the person needing the assistance,

15 a common language conversion processing of converting the score calculated by the score calculation processing into a common language commonly recognizable as an indicator for the health condition by both of the person relating to the person needing the assistance and the medical
20 profession,

 an admission necessity determination processing of determining as admission required when the score calculated by the score calculation processing does not satisfy a predetermined requirement, and

25 a result display processing of displaying the score calculated by the score calculation processing or the common language converted by the common language conversion processing.

30