Developing a Home-based Palliative Care Information System by utilizing Wired/Wireless Network and Mobile Computing System in Japan

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INTRODUCTION

・In recent years, information and communication technology (ICT) has been recognized as a tool for improving care delivery, symptom assessment and communication between medical staff and patients/families in palliative care settings.

・However, the efficient sharing of information and the process of communication within interdisciplinary teams has not been well supported technologically in the delivery of home-based palliative care.

・To ensure that home-based palliative care is provided reliably and sustainably, we developed a network-based information system for specialized palliative care consulting teams in the community.

METHODS

To improve the efficiency of visiting clinicians and nurses overburdened with paperwork and frustrated with bottlenecks in the information exchange process, we deployed a database system using FileMaker Pro® (FileMaker, Inc. CA,U.S.A.), which utilizes the wire-wireless network and the mobile computing system from July,2003.

This system provides the connectivity required to enable complete workforce mobility. Our staff can carry the mobile computer while out in the field. More importantly, with its integrated modem, wireless LAN capabilities, and fast 10/100 Ethernet, the mobile computer allows users to stay connected at all times. It enables interactive communications between the office headquarters and professional over the intranet.

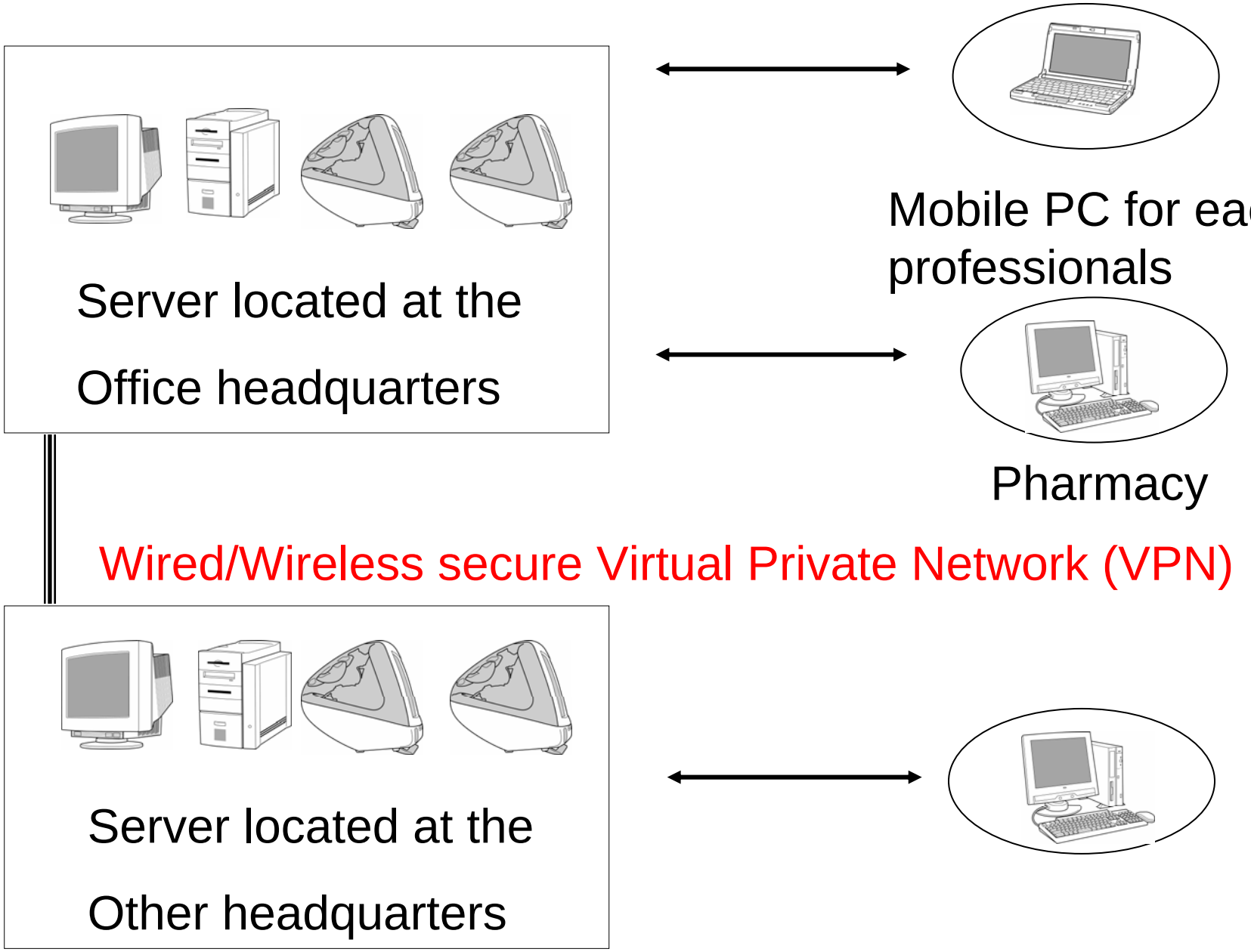


Fig.1 Wired/Wireless Network and Computer Systems

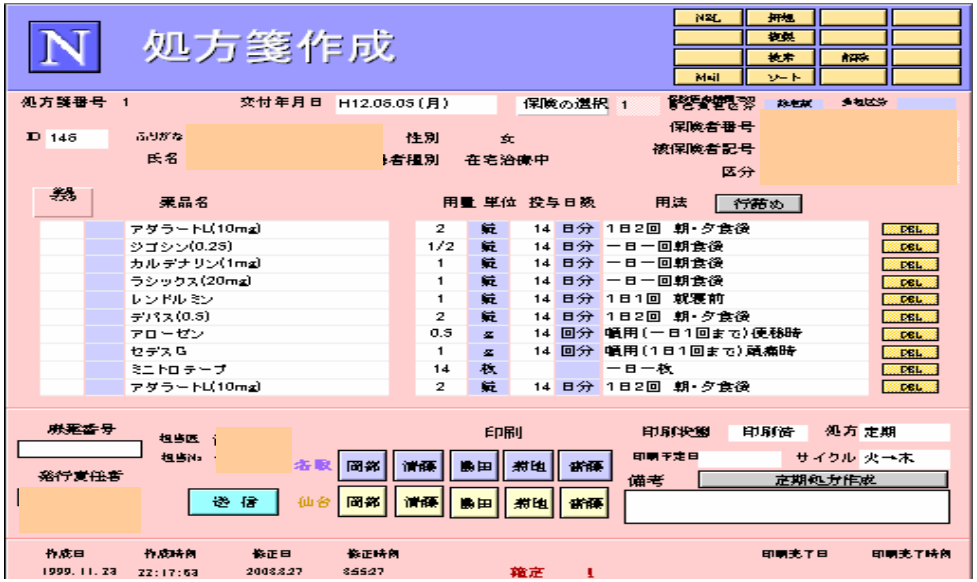
This database comprises information relevant to the patients including details on their family, home, medication, and actual clinical status assessed by each professional. It is designed to improve clinical information, facilitate an interdisciplinary team approach, and allow collecting structured clinical data in general practice on a daily basis.

During each visit, a professional briefly assesses the symptoms, side- effects, and other key problems of the patient and enters this information into the system. Subsequently, when other professionals access the patient’s electronic medical record from virtually anywhere, a window appears containing the patient’s complete assessment information.

Physicians and managers receive updates regarding the quality of treatment received by the patient. Each patient’s identifiable data is securely and confidentially maintained in the server located at the office headquarters.

N
診 療 録
N&L
新規
検索用記録
分布図
複製
検索
解除
印刷
ソート
ID
30266
記載者
診察日
2003.6.19
患者種別
診察時刻
11:30
保険種別
所見
SpO2/99(2/1nasal)HR101RR18
chest:右肺雑(＋)胸郭右にシフト。
半開眼。呼び掛けに少し表情かえる程度。in100-200,out500
とう骨動脈触知可能。
痛み・呼吸苦訴えなし。
苦痛からは開放され穏やかな状態。このまま自然の経過にまかせる旨を説明。
visit note by physician
指導項目
新患新規指示出
同一患者同一担当者新規指示出
同一患者担当者なし新規指示出
8096
6.9.月
指示者
担当者
承認
Foley留置。ロピオン50mg5mL2A＋生食38mL=計48mLをクーデックで2ml/hrでCV三活からDIV.
訂正して承認
承認状態
承認済
指示受状態
受け済
7955
承認日
6.9.月
受領日
6.9.月
長文の指示は看護記録で見づらくなるのでご注意
Physician's order

N
作業療法記録
開く
ソート
逆ソート
ID
2613
在宅治療中
処置日
03.6.17(火)
記載者
保険種別
介護
開始時刻
11:30
終了時刻
12
血圧
130/80
脈拍
91
酸素
94
呼吸
体温
プログラム1
関節可動域訓練
プログラム2
W/C移乗
プログラム3
#1 痛みあり、姿勢変換困難。
ベッド上にて、苦痛様の表情あり。ROM施行中、痛み訴えないが、違和感はあるか？眉間にしわを寄せ、声をあげることはあり。
#2 活動不耐性
車椅子レンタル開始している。
本日、リクライニング車椅子乗車。2名介助。15分ほど乗車。
やや緊張した様子であるが、乗車時の苦痛なし。
60°程度の座位にて、BP106/60へ。SpO2変化なし。
85°程度でも、座位の安定性は良いが、ヤクルトをストローにて飲むと、咽せあり。
60°程度で様子みる。スナック菓子・ヤクルトを手に持たせると自力で摂取可。
#3 呼吸機能
spO2良好。著変なし。
visit note by OT/PTs


N
処方箋作成
N&L
新規
複製
検索
解除
Mail
ソート
処方箋番号
1
交付年月日
H12.06.05(月)
保険の選択
1
ID
146
ふりがな
性別
女
氏名
患者種別
在宅治療中
保険者番号
被保険者記号
区分
薬品名
用量
単位
投与日数
用法
行間詰め
アダラートL(10mg)
ジゴシン(0.25)
カルデナリン(1mg)
ラシックス(20mg)
レンドルミン
デパス(0.5)
アローゼン
セデスG
ミニトロテープ
アダラートL(10mg)
麻薬番号
発行責任者
印刷
印刷状態
印刷済
処方
定期
サイクル
火～木
備考
定期処方作成
送信
作成日
1999.11.23
作成時刻
22:17:53
修正日
2003.8.27
修正時刻
8:55:27
確定
Prescription

N
ホームヘルプ記録
N&L
新規
複製
検索
解除
ソート
ID
1941
要介護区分
業務日
10:00
終了時刻
11:00
ヘルパーへの指示・連絡
体温
脈拍
呼吸
血圧
便量
便色
尿量
尿色
サービス内容
単位
時間
サービス合計
状況
感想・意見
今日は青替えは嫌だということで、顔と手だけ拭かせてもらった。ほとんど目も開けていて、側臥位にする際にも声を掛けると「できるかや」と協力してくださった。初めは「足が痛い」とおっしゃっていたが、身体を動かしているときに痛い様子も見られなかった。
アイスがお好きなようで、ペロリと食べてしまいました。水では少しむせがありましたが、アイスはむせることもな
作業内容
7 陰部洗浄
8 おむつ交換
28 清拭
39 体位変換
連絡事項・予定
飲食
visit note by home health aides

Assessment of Symptoms on a each nurse's visit basis

PS	全てに正常に制限なく行動できる	激しい運動は制限されるが歩行や軽い仕事はできる	軽労働不可。歩行、身の回り可。時に介助必要。50%以上起居。	身の回りのことはある程度できるが、しばしば介助必要。50%以上は臥床(または車椅子)	身の回りのことができず、全介助。終日臥床(または車椅子)
倦怠感	なし	軽度あるが支障なし	多少活動を制限	著明に活動を制限	
食欲不振	よく食べられる	まあまあ食べられる	あまり食べられない	全く食べられない	
嘔気	嘔気なし	嘔気はあるが辛くはない	しばしばあるが、何とか耐えられる	耐えられない程辛い	
嘔吐	嘔吐ない	嘔吐 辛			
呼吸困難	なし	軽度あ			
咳	なし	軽度あ			
痰	なし	軽度あ			
腹部膨満感	なし	軽度あ			
浮腫	なし	足首、			
皮膚乾燥					
口渇					
傾眠傾向					
意識障害					

嘔気値	嘔吐値	呼吸困難値	咳値	痰値	腹部膨満感値	浮腫値	皮膚乾燥値	口渇値	傾眠傾向値	意識障害値
0	0	2	0	0	2	1	1	3	2	2
0	0	2	0	0	2	1	1	3	2	2
0	0	2	0	0	2	1	1	3	2	2
0	0	2	0	0	2	1	1	3	2	2
0	0	2	0	0	2	0	1	3	2	2

0: absent
1: mild
2: moderate
3: severe

Intensity of symptoms experienced at the time of nurse's visit

PS(ECOG), fatigue, anorexia, nausea and vomiting, dyspnea at rest cough, sputa, abdominal distention, edema, dry mouth, drowsiness insomnia, anxiety, bed sore, pruritus, dysphagia, numbness mouth ulcer, dizziness, depression, cognitive disturbance

RESULTS

The system has been successfully implemented and used, especially to improve communication within the interdisciplinary team. With this system, our field staff can electronically submit clinical visit notes – a process that had previously been done on paper, mostly in narrative form.

By requiring users to fill out the information in a structured electronic format, we can accurately and efficiently collect a wealth of valuable data for future analysis and develop superior structured care plans before each patient visit. It also complemented an interdisciplinary team meeting and offered 24 hours/7 days assistance.

After deploying this system, we have been able to improve patient care by reducing the administrative workload of our mobile workers. Clinicians and nurses can now focus on delivering high quality care, significantly improving their own quality of life.

In addition, field nurses may be able to make three or four additional visits each week. This system also assists the operation of home-based palliative care in the night time and over the weekend; these has led to an increase in the number of patients per team.

To date, this system has been used for more than 50 advanced cancer patients and approximately 200 chronic ill patients.

DISCUSSION

By equipping our field staffs with this system, we have enabled them to spend more time providing care in patients' homes and less time filling out paperwork.

Now, as our staffs make their daily rounds to patients' homes, they have all the information they need right at their mobile computers. Patient records, including medical and care history, medications, and insurance information, are just a few clicks away.

In this project, we did not take quality of symptom control, cost of care and this system into consideration. Further studies should assess symptom control as well as patient and family satisfaction. Further research should also address cost of care.

CONCLUSIONS

An infrastructure that shares the database of patient's records is developed for home-based palliative care performed by the interdisciplinary team.

As a result, we now have access to all patient-related data collected by the interdisciplinary team and can leverage that data to develop new treatment plans and processes that will further enable the consistent delivery of high-quality patient care across the community.

References

[1] Lind L, Karlsson D. Symptom assessment in homecare using digital pens. AMIA Annu Symp Proc, 2003: 914.
[2] Pearson WS, Bercovitz AR. Use of computerized medical records in home health and hospice agencies: United States, 2000. Vital Health Stat 13, 2006 Jun ; (161): 1-14.
[3] Aoki N, Ohta S, Yamamoto H, et al. Triangulation analysis of tele-palliative care implementation in a rural community area in Japan. Telemed J E Health, 2006 Dec; 12(6): 655-62.
[4] Lynch M. Pain as the fifth vital sign. J Intraven Nurs, 2001 Mar-Apr; 24(2): 85-94.

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