Implementation of Personal Health Records in a Rural Community of Central Taiwan

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Mountain Indigenous Townships in Taiwan

30 Mountain Indigenous Townships cover 44% area, but only less than 1% population of Taiwan (80% Indigenous people)
Greater Puli Area

9% of Taiwan Area
0.7% Population (167,000)
92 Mountains > 3000m
80% Aborigines in 2 townships
Aged Society: 17% Elderly

Medical Centers

South Puli Medical Centers
VGHTC
CMUH
CSMUH
CCH

Nantou County
921 Earth Quake (1999 Sep. 21)
Severe damage and destruction in Nan-Tou County
Reform of Community Health System

- New Community Healthcare Network
  
  1. Organize a Community Medical Group
  2. Establish a Family Doctor system
  3. Build a Community Health Information system
Community Health Information System

Community Healthcare Management Database

Clinical Database

Academic Database

Family Physician

Healthcare Call Center

People in Community

Health Counseling

Emergency Medical Care

Appointment Registration

Private Database

Public Database
CMG-HIFDS
Community Medical Group Health Information and Family Doctor System

400+ CMGs with 3000+ family doctors in Taiwan
CMG-HIFDS
Family Folder/Personal Health Records
CMG-HIFDS
Family Folder/Personal Health Records Prototype

- Community-based, patient-centered, family-oriented
- Family Information,
  - Address, family members, family history
- Personal Health Information
  - Demographic data
  - Chronic active problem list
  - Medication, drug food allergy history
  - OPD, Admission, Emergency service visits records
  - Consultation and Referral records
  - Immunization and Preventive services records
The Development of National Taiwan Health Information Network

- 1988-1998 National Health Information Network (HIN)
  - Public health administration and health insurance management
- 1995~National Health Insurance (NHI)
- 1999~ National EMR Exchange Center (EEC)
  - Standards and exchange of electronic medical records (EMR)
- 1999-2003 National Health Information Network (HIN 2.0)
- 2001~2003 National Health insurance IC Card
- 2008~2011 National Health Informatics Project (NHIP)
  - Citizens could get their own health information (PHR)
- 2009~ National Medical Image Exchange Center (IEC)
- 2013~Taiwan Health Cloud Project (THC)
Electronic Medical Records Exchange Center (EEC)
National Medical Image Exchange Center (IEC)
Regional Health Information Organization (RHIO): A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.
Personal Health Records and Taiwan Health Cloud Project

- Health Promotion Cloud
- Medical Cloud
- Personal Health Records (PHR)
- Care Cloud
- Diseases Control Cloud
My Health Bank and PharmaCloud

MHB Mechanism
- Hospital/clinic upload medical information to NHI Agency Server
- NHI Agency manage personal healthcare information
- Patient use Citizen IC card NHI website to download personal health care information within a year

PharmaCloud Mechanism
- Hospital/clinic upload medication information to NHI Agency Server
- Patient sign the consent for information sharing among institutions
- Healthcare providers use professional IC card+Patient NHI IC card to access medication information during visit
Development of PHR in Taiwan

- 2000 Community Medical Group (CMG)
- 2001 Community Healthcare Information System - Family Folder/PHR Prototype
- 2009 Taiwan Association Family Medicine (TAFM) PHR Working Group
  - 2010 PHR Guideline Published
  - 2015 TAFM Working Group for PHR Content
- 2016 MOHW Project of PHR Planning
  - Multidimensional Content Structure
2010 TAFM PHR Guideline

2010 TAFM PHR Guideline

定義

個人健康紀錄（Personal Health Records，以下簡稱PHR）為由民眾自主維護與管理的健康紀錄，包含自發的健康促進行為與求診診療過程取得的病歴紀錄，以及為了自我健康管理所衍生的應用服務。

前言

由於資訊通訊科技的進步，電子化的健康紀錄已成為世界各國衛生醫療的新趨勢，然而過去延續傳統醫療紀錄之電子病歷（Electronic Medical Records，以下簡稱EMR）系統的發展，主要是提供健康照護專業人員在臨床醫療中所使用之紀錄，並非從病人健
康維護與管理的角度來考量。近年來由於病人自主意識與主動參與態度的提升，自
21世紀另一種個人健康紀錄—PHR的觀念開始被提出，且逐漸地被一般人所接受。已經有許多學術研究機構、政府單位及健康照護與醫療資訊產業，陸續發展了一些PHR資訊系統離型衛生健康管理工具。然而目前PHR的發展仍屬早期階段，尚未有一個
明確公認的標準規範包括其涵蓋內容架構與系統技術規格。

PHR的目的主要是為協助人們對自我健康能更深入了解、並利用它做為終身健康管理的工具。PHR的價值在於長期累積健康紀錄，對於個人健康的促進，及未來面臨疾病產生時，能有充實的資料給予健康照護者參考。另一方面，PHR的資料館有多方管道加以建立，必須結合其他健康相關產業與資訊通訊技術來協助個人建立與管理，未來PHR
的興起將可帶動其他相關產業發展。

由於PHR牽涉廣泛，除就診醫療的紀錄外，舉凡食、衣、住、行、育、樂的日常活動都是可以被記錄並加以應用的，因此通常是由資訊通訊科技產業整合各種服務個人
健康的相關產業而成一種軟體、系統、平台或雲端之應用服務。此種創新的個人健康管理模式，需透過緊密的醫病互動關係，結合導入新興健康管理專業人員，組成一個周
全性、持續性的無縫整合個人健康管理團隊。家庭醫療師在基層醫療扮演健康管理守門人的角
色，以個人為中心，家庭為單位，社區為範圍，強調生物心理社會與靈性整合之全人
的健康照護模式，正是此健康管理團隊的領導與協調的關鍵角色。因此本台灣家庭醫學會
特別制定此PHR指導原則，作為基層健康照護專業人員從事個人健康管理與維護時選
擇PHR之依據，以及未來提供PHR服務的基本標準規範。

指導原則

PHR之建立

PHR為民眾個人可自己產生、維護與管理的健康紀錄，包含病人跟醫療院所取得之
電子病歷資料。PHR的使用者以個人觀點為主，包括機構間的整合（診所、醫院或長期照護單
位），以及時間歷程上的整合（依年齡、時間產生的紀錄資料）。

PHR之所有權

PHR的擁有者屬於「個人」所有，因此PHR應可儲存於可攜式媒體，跟著個人走，任何單位或個人如需存取或使用個人健康紀錄，須徵當事人同意授權，而且可依據個人
意願考量，授權部分或全部之個人健康紀錄。PHR與EMR是不同的，是以個人觀點保
存紀錄，法律上不具備醫療文件的屬性，而是個人資料的屬性。

PHR之內容

PHR的內容應為個人終生健康的紀錄，包括從小到大慢慢累積增加的紀錄，病人生
涯中健康產生之健康紀錄，例如健康檢查、門診、急診以至住院之紀錄。PHR之擁有者個人
可隨時把健康照護管理過程資料整合入PHR，例如疫苗注射、青少年性教育、疾病防
護及追蹤、老年慢性病的管理等。另一方面健康照護提供者主動提供病人健康照護之紀
錄亦可納入，例如醫院所提供之衛教、遠距健康照護等。一般人由於遠距照護推廣，更多
應用包含，個體使用家屬或護理人員之健康教育或生理數值，飲食、藥物服用、體能活
動、睡眠、心情、壓力事件、人際關係與社交活動、職業、工作或旅遊與健康相關的接
觸或暴露等紀錄。安寧照護相關的收治急診事故或公害遺篩等文件。

PHR之存取

PHR以數位方式儲存紀錄，可採用可攜式媒體或線上資料庫。以採用可攜式媒體方
式，個人在接受各種健康照護過程，可以直接下載相關紀錄，自我健康管理時也可透過
客製化使用介面儲存相關紀錄。如採線上資料庫，PHR之存取檔案必須提供網際網路認證機
制，個人經註冊後始可管理自己的資料。個人也可以授權醫療相關機構，傳播自得的文件
或影像資料與報告。尤由診療過程取得的病歷紀錄轉入至PHR以後，不具備病歷的
法律效力，僅能提供健康管理者作為參考之用。

PHR之資訊安全

PHR必須提供資訊安全機制。如採用可攜式媒體储存，至少要有個資保密與加密功
能。如果以網際網路資料庫之基礎，業者需有資訊安全管理認證，例如ISO27001認定，
且需配合政府政府合格的網路安全業者保其資料安全。對於個人親權的各種不同的服務
提供者，需有互信其權限與資料分級分類的機制以管制PHR之存取使用，包括各種健康
照護者、保險或政府衛生單位等。

PHR偏重個人隱私維護的機密性（confidentiality）、可取得性（availability）與存
取的授權識別性（authenticity）等，不像EMR具有醫療文件的不可否認性（non-repudiation）
與完整性（integrity）之絕對要求。PHR於無需傳達資料時必須去個人識別機制（
de-identified），以保護個人隱私免於盜取或揭露。
Multi-Dimensional Content Structure

- Natural History of Disease
  - 4 Stages 7 levels of Preventive Medicine
- Continuum of Healthcare
  - Preventive, Emergency, Acute, Subacute, Longterm, Terminal Care
- Holistic Care
  - Bio-Psycho-Socio-Spiritual
- Assisted Living
  - food, clothing, housing, transportation, education, and recreation
- Age
- Sex
- Risk factors
# Natural History of Disease

## Stages and Levels of Preventive Medicine

<table>
<thead>
<tr>
<th>Susceptible (Non-diseased)</th>
<th>Preclinical (Subhealth)</th>
<th>Clinical (Diseased)</th>
<th>Disable (Diseased)</th>
<th>Terminal (Death)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Secondary</td>
<td>Tertiary</td>
<td></td>
<td>End</td>
</tr>
<tr>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 4</td>
<td>Level 6</td>
</tr>
<tr>
<td>Health Promotion</td>
<td>Specific Protection</td>
<td>Early Diagnosis</td>
<td>Limitation of Disability</td>
<td>Palliative Care</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Vaccination</td>
<td>Screening</td>
<td>Physical therapy</td>
<td>Bereavement Care</td>
</tr>
<tr>
<td>Exercise</td>
<td>Occupational protection</td>
<td>Periodic health exam</td>
<td>Occupational therapy</td>
<td>Hospice care</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
<td>Psychosocial and spiritual Support</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Level 1**: Health Promotion
- **Level 2**: Specific Protection
- **Level 3**: Early Diagnosis
- **Level 4**: Limitation of Disability
- **Level 5**: Rehabilitation
- **Level 6**: Palliative Care
- **Level 7**: Bereavement Care
Holistic Care

- Maslow's hierarchy of needs

![Maslow's hierarchy of needs](image)
Holistic Care in Community

- 1980 George Engel biopsychosocial model
- **Holistic Health Care**
  - Client Centered
  - Preventive to Palliative (Hospice)
  - Holistic Approach (Bio-Psycho-Socio-Spiritual)
  - Whole Community (Population)
  - Concept of Family Medicine: Comprehensiveness, Continuity, Coordination, Accessibility, and Accountability
Assisted Living

- Food: meal prepare/delivery
- Clothing: dressing, laundry
- Housing: elderly apartment facilities, dormitory/hotel room, toileting/bathing assisted facilities, shared living room/kitchen/dining room, beauty parlor
- Transportation: transferring, escorts to meals and activities
- Education: school of wisdom, volunteer training
- Recreation: social/health activity program music/arts performing,
Integrated PHR with Prevention, Medical Care and Long Term Care

Health Information Management Center

<table>
<thead>
<tr>
<th>Prevention Stages</th>
<th>Hospital</th>
<th>4 stages 7 levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare Continuum</td>
<td>Institution</td>
<td>Community</td>
</tr>
<tr>
<td>Holistic Care</td>
<td>Bio-psycho Socio-spirit</td>
<td>Six Categories</td>
</tr>
</tbody>
</table>

- **Bed**
- **Quality**
- **Fees**
- **Supplies**
- **Facilities**
- **Performance**
- **Medical Records**
- **Reports**
- **Personnel**
- **Education**
- **Information Management**
- **Environment**
- **Safety**
- **Sanitation**

**Setting & Personnel**
- Clerks
- Care Giver
- Social Worker
- Nutrition
- Rehab
- Teacher
- Psychologist
- Chaplin
- Family
- Foreign Care Giver
ePCH: Mobile App for PHR

Homepage

Registration and Login

Content of PHR
ePCH: Mobile App for PHR(II)

Medication Records

- **2017-08-28** 胸腔内科 植葉坤醫師
  - 內舒拿鼻用噴霧劑
    - 每天一次, 早晚, 鼻用, 1x1, 28天
  - 咳治得軟膠囊100毫克
    - 一天一次, 睡前, 飯後使用, 1x3, 28天
  - 勿用氣化器
    - 一天一次, 睡前, 飯後使用, 1x1, 28天
  - 艾萊 0 00公絲錠
    - 一天一次, 睡前, 口服, 1x1, 28天

- **2017-08-11** 陳健科 陳雲營醫師
  - 美確控注射液50%
    - 立即使用, 局部注射, 1x1, 1天
  - 需要時, 局部注射, 1cc, 1天
  - 生理食鹽注射液
    - 立即使用, 局部注射, 1x1, 1天

- **2017-08-01** 胸腔内科 植葉坤醫師
  - 小蘇打水灌膚劑

Remote monitoring

- **2017-10-04** (預約掛號) 植葉坤, 胸腔內科, 早上, 147診21號

Calendar

Share with Family Member and Doctor
ePCH: Mobile App for PHR(III)

Medical Records in PHR for Family Doctor and e-Referral
Future Prospects of PHR

- PHR has empowered the engagement of patients and general public in their own health promotion and management.
- With the advance of wireless network, wearable biosensor, and information technology, numerous new applications of remote physiological monitoring, health consultation, health education, and life support have filled up partial gaps and holes of current fragmented healthcare system.
- To develop and health cloud Integrated with IDS and CMG in community to achieve holistic and ubiquitous healthcare
Article 11 A physician may not treat, issue prescription or certificate of diagnosis to patient not diagnosed by the physician himself or herself. In mountain areas, on outlying islands, in remote areas, or under special or urgent circumstances, however, and in response to medical needs, physician appointed by the competent authority in a special municipality or county (city) may use telecommunications methods to inquire about illness, set diagnosis and issue prescriptions, and treatment may be dispensed by nursing or obstetrics personnel belonging to health organizations.

The telecommunications diagnosis and treatment formulated in the proviso in the previous item, the related treatment items, appointment of physician and telecommunications methods shall be defined by the competent central authority.

6 Special Circumstances
- Chronic disease with ambulation difficulty
- Discharge within 3-6 month after hospitalization for acute condition
- Residents of long term care institution
- International patient
- Home medical care program
- Integrated healthcare program by family physician
Ubiquitous Healthcare

Community Hospital

CMG: Community Medical Group

Family doctor of Clinic 1

Family Members Work Site

Care Center

Internet

Ambulance

Homecare nurse

DTV

Sensor

Sensor area
Conclusion

- We expect more extensive application of PHR for the future capitation payment system of national health insurance

- **National Health Insurance Law Art. 44**
  - To promote preventive medicine, implement the referral system, and to improve the quality of medicine and treatment, the Insurer should draft the family physicians system.
    The benefits of the family physicians system should be paid out on a per person basis

- PHR will become an important tool to provide comprehensive, continuous and holistic healthcare for primary care family doctors in community
Thank you.