



Application of REDCap System: Focus on Quality Management

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National Taiwan University Hospital



- A public, university-based, tertiary medical center at Taipei
- Founded in 1895
- Recognized by the public and media as the best teaching hospital and top medical school in Taiwan.



National Taiwan University Hospital

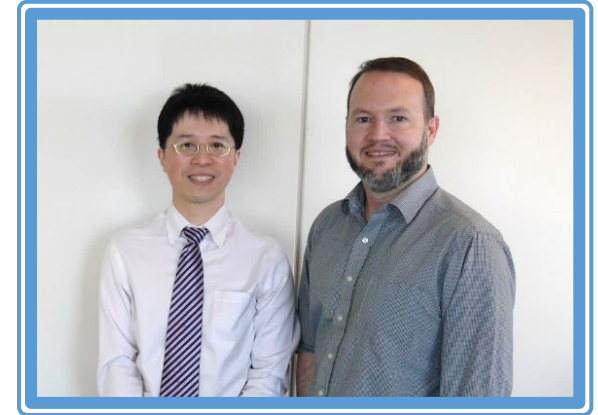


- Main hospital and 5 branch hospitals
- Main hospital:
 - 6866 employees
 - 660 attending physicians and 630 residents
 - 3000+ nurses
 - 2132 in-patient beds
 - Including 243 ICU beds
 - Annual stats:
 - In-patient: ~300/day
 - Out-patient: ~9000/day
 - Emergency: ~300/day





- Developed by Vanderbilt University Medical Center for 15 years
- Consortium
- Frequent updates with new functions
- Weekly web meetings. Yearly conference.
- NTUH set up REDCap in 2017

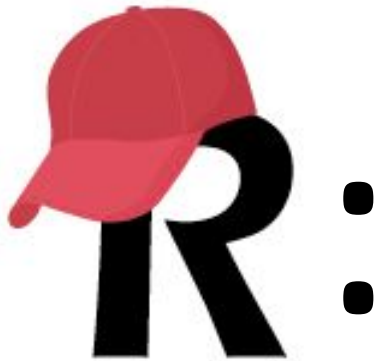


Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics* 42 (2009) 377–381

REDCap is licensed for free to non-profit institutions around the world



Institutions	Countries	Projects	Users	Articles
3690	131	762k	1m	7097



*A secure web application
for managing your data
online*


Applications of REDCap

- Clinical trial / study
- Clinical service
 - Case management
 - Extension of hospital information system (HIS)
- Administrative use
 - Quality management
 - Patient satisfaction survey

Advantages / Features of REDCap

- Server/storage located within institution
 - Not a cloud service
 - Sensitive data management. Security.
- Customizable forms/instruments/survey
- User-friendly interface. Suitable for PC, laptop, tablet, smartphone
- Language translation
- Privilege control within project
- Messenger and file transfer
- Mobile app for off-line data collection
- Export as statistical software format
- Connection with other systems, such as hospital information system (HIS)

Data Entry Form – accessed by REDCap users



Logged in as **rc_fund** | [Log out](#)

[My Projects](#)

[Project Home](#) or [Project Setup](#)

[REDCap Messenger](#)

Project status: **Development**

Data Collection [Edit instruments](#)

[Survey Distribution Tools](#)

- Get a public survey link or build a participant list for inviting respondents

[Record Status Dashboard](#)

- View data collection status of all records

[Add / Edit Records](#)

- Create new records or edit/view existing ones

[Study ID **Test1** \(1, Test\)](#) [Select other record](#)

Data Collection Instruments:

- Demographics**
- Baseline Data
- Pain Management Survey - PRE
- Intervention Data
- Pain Management Survey - POST
- Study Completion

Applications

- [Calendar](#)
- [Data Exports, Reports, and Stats](#)
- [Data Import Tool](#)

DEMO: VICTR Research Study

Actions: [Modify instrument](#) [Download PDF of instrument\(s\)](#) [VIDEO: Basic data entry](#)

Demographics

[Editing existing Study ID **Test1** \(1, Test\)](#)

Study ID	Test1 <small>To rename the record, see the record action drop-down at top of the Record Home Page.</small>
Contact Information	
First Name	<input type="text"/>
Last Name	<input type="text"/>
Phone number	<input type="text"/> <small>Include Area Code</small>
E-mail	<input type="text"/>
Date of birth	<input type="text"/> <input type="text"/> <input type="text"/> <small>Y-M-D</small>
Ethnicity	<input type="radio"/> Hispanic or Latino <input type="radio"/> NOT Hispanic or Latino <input type="radio"/> Unknown / Not Reported reset
Race	<input type="text"/> reset
Has the patient given birth before?	<input type="radio"/> Yes <input type="radio"/> No reset

[Save & Exit Form](#)
[Save & Stay](#)
[-- Cancel --](#)

Pain Management Survey - PRE

Resize font:
+ | -

Please complete the survey below.

Thank you!

Are you in pain today?

☐ Yes

☐ No

reset

What do you think about these medication features?

	1 Not important to me	2	3 Neutral	4	5 Very important to me
Pill size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pill form (tablet, capsule, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How soon it takes effect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How long the effect lasts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in a day I have to take it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

reset

reset

reset

reset

reset

reset

How has pain affected your life?

Expand

Submit

Save & Return Later

Survey –
completed
by a
participant

Satisfaction Survey

- Simple questionnaire connected via hospital website or poster at cashier counter

Hospital
Website



A screenshot of a hospital website's navigation and service area. The top navigation bar includes links for '訊息專區', '認識台大', '就醫指南', '醫療團隊', '特色醫療', and '為民服務'. Below this, a '教學研究' link is visible. The main content area features a large banner image of a family. To the left, a sidebar titled '為民服務' lists various services: '諮詢服務' (with sub-items: 藥品綜合查詢, 病人用藥查詢, 藥品教育單張, 常見問題), '服務信箱', '用藥諮詢', '營養諮詢', and '護理照護' (with sub-items: 出院準備服務, 糖尿病衛教服務, 營養照護服務, 氣喘疾病管理). To the right, there are sections for '醫療品質暨滿意度調查' (with sub-items: 優良事蹟, 臺大醫院歷年滿意度趨勢, 滿意度調查, 健保局 VF) and '滿意度調查'. The '滿意度調查' section includes a message to patients and a list of survey types: '門診病友 滿意度調查', '一般病房住院病友 滿意度調查', '加護病房住院病友 滿意度調查', and '病友建言服務中心 滿意度調查'. The first three survey types are circled in red.

Survey

二、滿意度量表

(一)急診醫師照護

	非常同意	同意	普通	不同意	非常不同意	沒有接觸	
1. 醫師能清楚地回答您的問題	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	清除
2. 醫師態度親切和善	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	清除
3. 您滿意醫師對您的照護	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	清除

<< 前一頁

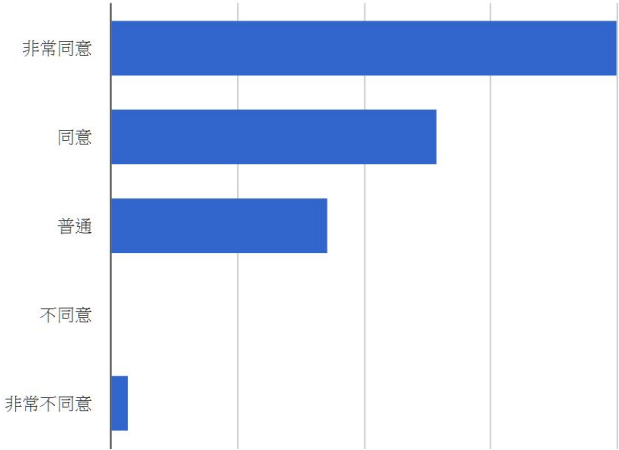
下一頁 >>

3. 您滿意醫師對您的照護 (b2_1_3) 重繪圖 | 長條圖 ▾

總數 (N)	缺漏值	相異值
59	77 (56.6%)	4

計數/頻率: 非常同意 (28, 47.5%), 同意 (18, 30.5%), 普通 (12, 20.3%), 不同意 (0, 0.0%), 非常不同意 (1, 1.7%), 沒有接觸 (0, 0.0%)

On-line Report



Case Management: Heart Failure

- Standalone
- Case registration and follow-up
- Multi-disciplinary patient care
 - Physician, nurse, dietician, pharmacist, physical therapist, etc.
- Export data file for quality management statistics and health insurance reimbursement

Case manager dashboard

[illegible]

血壓
(mmHg)

* 必填



100/67

心跳
(bpm)

* 必填



78

出院前
NYHA Fc

* 必填

- ☐ NYHA Fc1 身體活動不受限，無心悸喘心絞痛(不收案)
- ☒ NYHA Fc2 身體活動輕度受限，日常活動可，據烈運動會喘心悸心絞痛(收案)
- ☐ NYHA Fc3 身體活動明顯受限，日常活動(掃地、走一樓)就有症狀，但休息可緩解(收案)
- ☐ NYHA Fc4 任何身體活動就有症狀，甚至躺著也會疲倦心悸喘心絞痛(vital sing穩定>72小時可收案)



清除

American College of Cardiology/American Heart Association classification of heart failure(C~D級才能收案)

* 必填

- ☐ Stage A: Patients at risk for heart failure who have not yet developed structural heart changes (i.e. those with diabetes, those with coronary disease without prior infarct)
- ☐ Stage B: Patients with structural heart disease (i.e. reduced ejection fraction, left ventricular hypertrophy, chamber enlargement) who have not yet developed symptoms of heart failure
- ☒ Stage C: Patients who have developed clinical heart failure
- ☐ Stage D: Patients with refractory heart failure requiring advanced intervention (i.e. biventricular pacemakers, left ventricular assist device, transplantation)



清除

C~D級才能收案

IADL
TOTAL

* 必填



5

檢視公式

IADL(需每次回診填，男性為0~5分,女性分數為0~8分)

IADL
購物

* 必填



- ☒ +1獨立處理所有的購物需求。
- ☐ +0可獨立小額購買。
- ☐ +0每次上街購物都需人協助。
- ☐ +0完全不會上街購物。

清除

+1獨立處理所有的購物需求。 +0可獨立小額購買。 +0每次上街購物都需人協助。 +0完全不會上街購物。

Input
form

Quality management: Pneumonia

- Import data from HIS every month
 - All patients with diagnosis of pneumonia and antibiotics therapy
- Manual confirmation and comments in REDCap
- Export as report format

Import data from file

						G	H	I	J	K	L	M	
	record_id	chart_id	gender	birthday	lca_id	entry_source	last_outdate	emergency_triagetime	admission_date	transferhospital	discharge_time	outcome	stroke
2	17TC		F	1933/	J18.9	急診	2017/2/7	2017/8/19 16:49	2017/8/21		2017/9/1 09:31	治療出院	Y
3	17TC		M	1961/	C34.11	轉診			2017/8/28		2017/9/1 09:46	改門診治療	
4	17TC		M	1939/	J18.9	急診	2017/7/31	2017/8/22 13:52	2017/8/23		2017/9/1 08:36	改門診治療	
5	17TC		M	1948/	C34.31	急診	2017/6/16	2017/8/23 14:14	2017/8/24		2017/9/1 08:58	改門診治療	
6	17TC		M	1951/	I46.9	急診		2017/7/28 15:48	2017/7/28		2017/9/1 08:35	改門診治療	
7	17TC		M	2012/	Z51.11	同一疾病14天	2017/8/21		2017/8/27		2017/9/1 15:36	改門診治療	
8	17TC		M	1937/	R51	同一疾病14天	2017/8/11	2017/8/21 21:46	2017/8/23		2017/9/1 08:18	改門診治療	
9	17TC		M	1965/	C11.9	同一疾病14天	2017/8/14	2017/8/16 11:58	2017/8/17		2017/9/1 08:18	改門診治療	
10	17TC		M	1941/	J13	轉診		2017/8/18 12:32	2017/8/23	聯福診所	2017/9/1 08:41	改門診治療	
11	17TC		F	1980/	C34.31	急診	2017/4/27	2017/7/13 14:27	2017/7/14		2017/9/1 09:43	改門診治療	
12	17TC		M	1930/	J16.0	急診		2017/8/21 11:05	2017/8/26		2017/9/1 10:00	改門診治療	
13	17TC		M	1966/	C79.89	急診	2017/5/5	2017/8/18 19:43	2017/8/21		2017/9/1 08:48	改門診治療	
14	17TC		M	1938/	J18.9	急診		2017/8/18 06:19	2017/8/19		2017/9/1 09:44	改門診治療	
15	17TC		F	2012/	J45.901	急診	2015/11/28	2017/8/29 06:09	2017/8/29		2017/9/1 11:47	改門診治療	

Dashboard

Record ID			On Admission Antibiotic Treatment Cases	Physician	administrator
19T04		2019/07/18 08:14-J18.9			
19T04		2019/07/21 08:13-J15.7			
19T04		2019/07/18 17:09-J18.0			
19T04		2019/07/18 10:34-J18.9			
19T04		2019/07/22 08:14-J18.9			
19T04		2019/07/31 09:34-J18.9			
19T04		2019/07/31 08:42-J18.9			
19T04		2019/07/23 09:17-J18.9			
19T04		2019/07/22 09:54-J18.9			

Input form

住院前1次X光：2019/07/14 12:50 EXAMINATION: Chest: PA View (Standing).
FINDINGS:
Placement of a nasogastric tube. Normal heart size. Ill-defined opacities in left lower lung clips in the RUQ abdomen.

住院前1次X光報告

☐ Consolidation

☐ Infiltration

☐ Collapse

☐ Air-bronchogram

☒ Opacity/Patch

☐ Haziness

☒ ill-defined lesion

☐ Ground glass opacity

☐ Pneumonia

☐ Infection

☐ Pleurul effusion

☐ Blunting of costophrenic an

☐ Tumor/Nodule

☐ Mass

☐ Atelectasis

☐ Bronchiectasis

☐ Normal

Shared Decision Making (SDM)

- Connection with HIS
- Medical staff initiate SDM and view the patient's preference result in HIS.
- Background connection with survey forms created by REDCap

Patient main page

入: 2019/07/03 床: T0-03A2-02-01 等:加護病床 住院中 重:Z9911

[詳細](#) [修改](#)

紀錄	診斷	醫療	護理	TPR	給藥	身體	處置	診療	藥品	更新	確認	簽章PIN	<input checked="" type="checkbox"/> 自印	查詢	報告	PACS
	過敏	MORE		簽收	治療	MORE		照會	血品	膳食	MORE		簡歷		MORE	

顯示內容 [診斷處置](#) [未確認醫令](#) [績效人員](#) [排程](#) [預掛](#) [溝通平台](#)

診斷/醫囑	生命徵象/報告	排程/照會	電子同意書	醫囑查詢
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診斷	醫囑	處方
O Legionnaires' disease A48.1 O Leptospirosis, unspecified A27.9	On ICU routine(入院檢查) Frequency:AS ORDER Condition: critical(入院檢查) 07/03~ 開	袋 Saline (NK) inj 72 mL IA infusion mL/時 ;for 1440分

[手術排程](#)
[手術紀錄](#)
[緊急手術排程](#)
[檢查排程](#)
[抗癌藥品\(黃單\)](#)
[拒絕急救](#)
[抗癌藥物同意書](#)
[同意書入口](#)
[手術類同意書](#)
[同意書簽署查詢](#)
[SDM](#)

SDM portal

醫病共享決策

李黃OO(F,1934,84y10m)

[啟單](#)

[查詢](#)

內科部



管灌方式之選擇

無法脫離呼吸器時，該選擇居家照顧還是呼吸照護病房
 糖尿病患者在使用口服降血糖藥後，應該進入針劑注射治療之時機
 長期呼吸器使用的病人要不要接受氣管造口術
 我該透析了嗎

[啟動](#)

[錯誤回報](#)

劉○○(M,1963 56y5m)

啟單

查詢

-請選擇-

啟動

建立日期	病歷號	姓名	SDM名稱	過程紀錄	決策輔助工具	啟動人員
2019/09/10	3638337	劉○○	長期呼吸器使用的病人要不要接受氣管造口術	點我填寫	點我填寫	郭○○
2019/09/03	3638337	劉○○	出院準備—髖/膝關節骨折手術後，我需要做復健嗎	點我填寫	檢視	郭○○

Patient QR code
access for PDA

國立臺灣大學醫學院附設醫院
National Taiwan University Hospital

您專屬的連結為 <https://redcap.ntuh.gov.tw/surveys/?s=PIXtpRIWvC>

或可掃描下方二維條碼



透析了嗎？

腎臟疾病惡化到腎功能剩下**15% -20%**就會有症狀出現，並慢慢累積，一直到腎臟功能剩下**5%-10%**，會出現貧血、食慾不振、電解質不平衡、鈣磷異常、水份累積造成水腫、血液的酸鹼值傾向酸性等症狀，這時候您就必須開始思考腎臟的替代療法。

末期腎
替代療

步驟2

幫助您對 “呼吸照護病房” 和 “居家照護” 做進一步的認識與比較

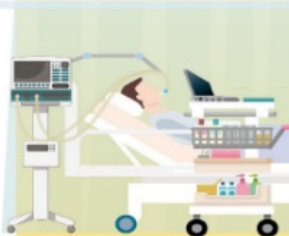
呼吸照護病房

評估要點

:

居家照護

評估要點



機構人員輪流照護。
由照護機構提供。

無需學習照護技能。

往返機構探視，有交通
由機構照護，透過機構

- 1. 每個機構不相同，林 (請洽機構瞭解)
- 2. 復健費用 (需自費)
- 3. 自行聘用服務員為病

* 必填

我很在意血
液透析併發
症

我很在意腹
膜透析併發
症

點擊滑動軸以修改回應

☐

清除

* 必填

我可以學習
換液技術及
自我照顧，
或我的家人
可以協助

我想由醫護
人員幫我執
行洗腎就好

點擊滑動軸以修改回應

☐

清除

* 必填

我願意接受
腹部開刀植
管子

我願意接受
手臂開刀做
瘻管

點擊滑動軸以修改回應

☐

清除

如果您以上5題的加總分數大於等於**250**分，代表
您較偏向血液透析(洗血)；如果小於**250**分，代表
您較偏向接受腹膜透析(洗肚子)。

以上5題的加總分數

劉○○(M,1963 56y5m) 3638337

啟單 查詢

-請選擇-

建立日期	病歷號	姓名	SDM名稱	過程紀錄	決策輔助工具	啟動人員
2019/09/10	3638337	劉○○	長期呼吸器使用的病人要不要接受氣管造口術	點我填寫	點我填寫	郭○○
2019/09/03	3638337	劉○○	出院準備—髖/膝關節骨折手術後，我需要做復健嗎	點我填寫	檢視	郭○○

Display of PDA

換藥水的時間
對我而言比較
有彈性

我可以配合到
醫院洗腎的時
間

我很在意血液
透析併發症

我很在意腹膜
透析併發症

99

我可以學習換
液技術及自我
照顧，或我的
家人可以協助

我想由醫護人
員幫我執行洗
腎就好

0

我願意接受腹
部開刀植管子

我願意接受手
臂開刀做瘻管

0

如果您以上5題的加總分數大於等於250分
代表您較偏向血液透析(洗血)；如果小於

132
(以上5題的加總分數)

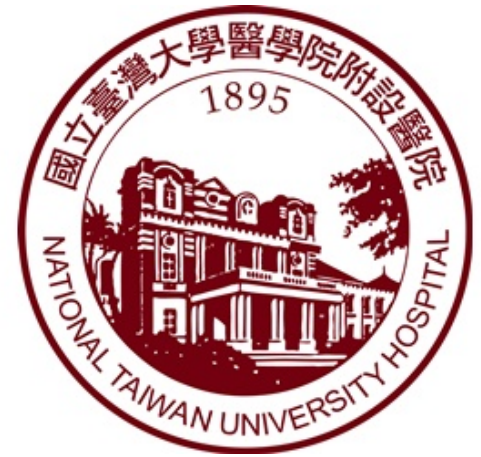


Benefits from Deployment of REDCap

- Highly customized instrument / survey for clinical and administrative purposes.
- Easy use with minimal training. No need of IT engineer support except connection with HIS.
- Rapid deployment.



<https://projectredcap.org/>



Thanks for your attention

Lu-Cheng Kuo

e-mail: kuolc@ntuh.gov.tw