

# Web-based medical records Are we ready?

A multicentre study into the attitudes of Australian families toward implementation of an internet accessible, electronic medical record for a paediatric population

# Background

- Within the area of child health, Australia was an early adopter of patient held medical records.
- In SA the “blue-book” was introduced in 1981
- A number of studies have shown good acceptance and use of the record

Jefferies D. Retention and use of personal health records: a population-based study. *J Paediatr Child Health*. Jun 1994 30 (3); 248-52  
Volkmer RE. Parental Perception of the use and usefulness of a parent-held child health record. *J Paediatr Child Health*. 1993;29(2)April:150-3

# Background

- UK:
  - NHS Care Records Service. A summary care record to be created for every citizen and stored electronically
- US:
  - Networks such as Kaiser Permanente incorporating millions of members presently use electronic patient held records.
  - President George W Bush “by 2014 every American must have a personal electronic medical record.”
  - Google and Microsoft have both launched a commercially available personal health record
- Australia:
  - “Health-book”
  - Health-Connect
  - *Healthlink*

# Pro's and Con's of Patient Held Records

## Pros

- Improved doctor-patient communication
- Educating and empowering patients
- Promoting adherence and self management
- Facilitating correction of errors
- Fewer repeated tests
- Improving patient satisfaction

## Cons

- Confidentiality
- Causing confusion or misunderstandings
- Creating anxiety
- Increasing litigious behaviour
- Adverse effects on the quality of record keeping
- Increased demands on staff time

## Lessons from the NHS National Programme for IT

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*A program of this size is bound to experience challenges*

*Picking the wrong patient consent model may be a deal breaker. Patients must give consent for their information to be stored electronically and made available to others.<sup>10</sup> CfH has chosen an “opt out” model in which patients by default are included within the system, and make an informed choice to leave it. For this to be fair, patients would need to be reached by an educational campaign before system implementation. Strident critics, such as the British Medical Association, counter that an informed choice to “opt in” would be a fairer model, as just among clinicians, but also the public. “Opting out”, while technically simpler, may end up being the Achilles heel of the new system should significant examples of breach of confidentiality hit the media. “Opting in” might eventually prove to be the cheaper model when all costs are considered, not just the technical ones.*

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# Consent model

## Opt in:

- Less professional resistance
- Less community resistance
- Less data capture

## Opt out:

- Greater professional resistance
- Greater community resistance
- Greater data capture
- Ethical issues should security breaches occur

# Previous studies

- Fowles et al
  - 4500 patients
  - 36% patient very interested and 43% somewhat interested in seeing their medical records
  - They showed a linear relationship between internet use and wanting to view the medical records
  - 49.3% said they would prefer to view a paper record in their own home, 43.8% said they would prefer to see the record over the internet
- Kleiner et al
  - 74% of parents surveyed expressed interest in using email to contact their child's doctor
  - Parents' concerns regarding confidentiality were quantified using a visual analogue scale for "strength of feeling." The mean score for concerns regarding confidentiality was 70-95/100

# Aim

- To assess parents' opinions regarding the creation of an internet accessible, electronic medical record
- To determine if attitudes are correlated with present internet use

# Methods

- PMH + WCH
- Inclusion criteria: parents/guardians of children attending the OPD for assessment or follow-up
- Validity of the sample was determined with reference to ABS/AIHW data on demographics and internet usage of the Australian population



11. Do use email?                      Yes    No  
      

12. How many hours (approximate) do you use the internet (including email) per week? (Please tick the correct box below).

- None
- No more than 5 hours a week
- Between 5-10 hours a week
- More than 10 hours a week

13. Have you ever bought anything over the internet? (please tick the right answer).

Never                       I have in the past but will never again                       I have in the past and probably will again.

14. Have you previously tried or do you currently use internet banking? (please tick the right answer).

Never                       I have in the past but will never again                       I have in the past and probably will again.

15. Do you pay bills over the internet? (please tick the right answer).

Never                       I have in the past but will never again                       I have in the past and probably will again.

**16. Based on the information you have been provided, would you like us to create an electronic medical record for your child that only you and your child's doctors would be able to see over the internet?**

**17. If offered, would you like to have a similar electronic medical record created for yourself that only you along with your doctors could see over the internet?**

18. If you do not like the idea of having an electronic medical record for your child that only you along with your doctors could see over the internet; is it because: *(please tick all the reasons below that apply)*

- You do not think it would be of use to you.
- You are concerned about your child's medical information falling into the wrong hands.
- You do not have access to the internet.
- Other reasons (please specify):

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**Thank you – your answers will be very useful to us in our attempt to improve medical record keeping.**

# Demographics

## Perth v Adelaide

	Perth	Adelaide	Total
Mean age of respondent	34.2 yrs	36 yrs	35 yrs
Median age of respondent	34 yrs	35 yrs	35 yrs
Mean number of children	2.3	2.4	2.3
Median number of children	2	2	2
Mean number of children requiring hospitalisation in the past	1.7	1.9	1.8
English as first language	93.4%	90%	92%
Internet access at home	72.6%	80.2%	72.8%
Use internet at least weekly	82%	88.1%	85.1%

# Demographics

## Study population v Australian population

### Study Population

- Mean age: 35 yrs
- Median age: 35 yrs
- Mean no. children: 2.3
- Median no. children: 2
- Mean no. children having required hospitalisation in past: 1.8
- English as first language: 92% participants
- Internet access at home: 72.8%
- Use the internet at least weekly: 85.1%

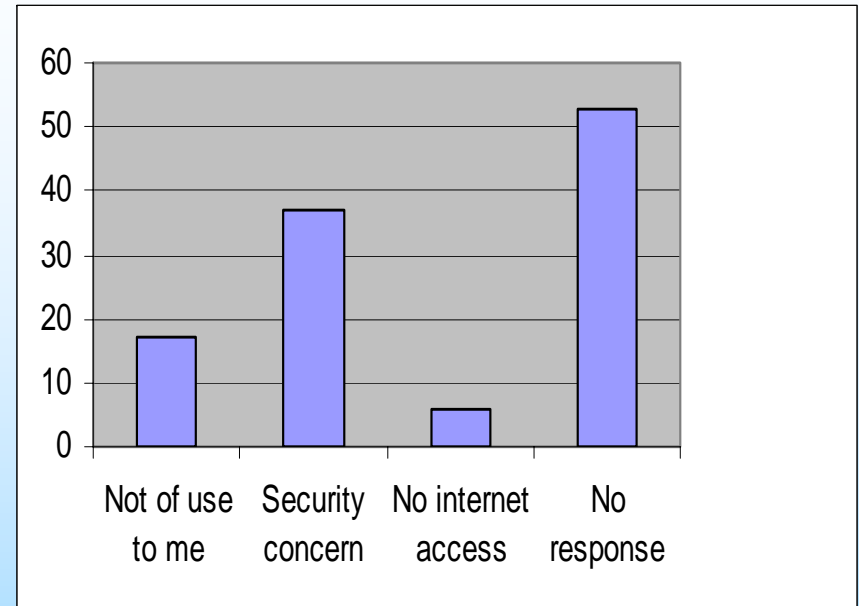
### Australian Population

(2006 Census figures)

- Median age: 37 yrs
- Median no. children: 2
- Internet access at home: 64% and 81% of households in which children under the age of 15 yrs live. (Overall SA – 57%, Perth – 66%)
- 92% people use the internet at least weekly
- 16% of Australians born overseas, in a country in which primary language is one other than English

# Results summary

	Yes	No	Total
Child's web-based medical record	284 (72.3%)	109 (27.7%)	393
Own web-based medical record	265 (67.8%)	126 (32.2%)	391



Proportion (%)	Precision	CI	Sample Size
60	0.05	1.96	368.79
70	0.05	1.96	322.69
80	0.05	1.96	245.86

# Attitude toward web-based medical record

## Perth v Adelaide

Attitude toward web-based medical record	Child's web-based medical record			Own web-based medical record		
	Yes	No	Unsure	Yes	No	Unsure
Perth	122 (61.3%)	43 (21.6%)	34 (17.1%)	116 (59.5%)	48 (24.6%)	31 (15.9%)
Adelaide	162 (83.1%)	8 (4.1%)	25 (12.8%)	148 (74.9%)	10 (5.1%)	39 (20%)
Total	72.3%	13.0%	15.0%	67.8%	14.9%	17.9%

# Effect of diagnosis on attitude toward electronic medical record

Diagnosis	All	Child web based medical record		Own web based medical record	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
		<b>p=0.035</b>		nonsig	
<b>Appendicitis</b>	116 (30%)	<b>93(80.2)</b>	<b>23 (19.8)</b>	74 (63.8)	40 (35.5)
Hernia	71 (18.3%)	42 (59.1)	28 (39.4)	46 (64.8)	25 (35.2)
Hydrocoele	14 (3.6%)	9 (64.3)	5 (28.6))	11 (78.6)	3 (21.4)
<b>Circumscision</b>	42 (10.9%)	<b>32 (76.2)</b>	<b>10 (23.8)</b>	31 (73.8)	11 (26.2)
Undescended testes	36 (9.3%)	22 (61.1)	14 (38.9)	20 (55.6)	15 (41.7)
Wetting	29 (7.5%)	19 (65.5)	10 (34.5)	19 (65.5)	10 (47.6)
Hypospadias	31 (8.0%)	22 (71)	9 (29)	23 (74.2)	8 (25.8)
<b>Neonatal Surgery</b>	37 (9.6%)	<b>32 (86.5)</b>	<b>5 (13.5)</b>	29 (78.8)	8 (21.6)
Misc	11 (2.8%)	7 (63.6)	4 (36.4)	7 (63.6)	4 (36.4)
Total	387 (100%)	278	108	260	124

# Effect of generation on attitude toward electronic medical record

Generation	All	Child web-based medical record		Own web-based medical record	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
		nonsig		p=0.067	
Gen Y Born 1980-94	87 (20.7%)	58 (66.7)	28 (32.2)	53 (60.9)	34 (39.1)
<b>Gen X</b> Born 1965-79	235 (60.4%)	172 (73.1)	63 (28.8)	<b>170 (72.3)</b>	<b>62 (26.4)</b>
Baby boomer Born 1946-64	64 (16.5%)	48 (75)	16 (25)	38 (59.4)	26 (40.6)
Mature Born before 1945	3 (0.8%)	2 (66.7)	1 (33.3)	2 (66.7)	1 (33.3)
Total	389 (100%)	280	108	263(100%)	123

# Effect of internet usage on attitude toward electronic medical record

Use of internet	All	Child web-based medical record		Own web-based medical record	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
Home internet		nonsig		<b>p&lt;0.01</b>	
Yes	300 (76.5%)	221 (73.7)	78 (26)	<b>217 (72.3)</b>	<b>80 (26.7)</b>
No	92 (23.4%)	61 (66.3)	31 (33.7)	<b>47 (51.1)</b>	<b>45 (48.9)</b>
Total	392	282	109	264	124
Any internet access		nonsig		<b>p&lt;0.01</b>	
Yes	355 (90.6%)	257 (72.4)	97 (27.3)	<b>251 (70.7)</b>	<b>101 (28.5)</b>
No	37 (9.4%)	25 (67.6)	12 (32.4)	<b>13 (35.1)</b>	<b>24 (64.9)</b>
Total	392 (100%)	282	109	264	125
Email use		nonsig		<b>p&lt;0.01</b>	
Yes	304 (77.2%)	223 (73.4)	80 (26.3)	<b>224 (73.7)</b>	<b>77 (25.3)</b>
No	85 (21.6%)	56 (65.9)	29 (34.1)	<b>38 (44.7)</b>	<b>47 (55.3)</b>
Total	389 (100%)	279	109	262	124
Use of internet		<b>p=0.001</b>		<b>p&lt;0.01</b>	
Internet hrs < 5/wk	227 (57.8%)	<b>150 (66.1)</b>	<b>77 (33.9)</b>	<b>133 (58.6)</b>	<b>93 (41.0)</b>
Internet hrs 5+/wk	166 (42.2%)	<b>134 (80.7)</b>	<b>32 (19.8)</b>	<b>132 (79.5)</b>	<b>33 (19.9)</b>
Total	393 (100%)	284	109	265	126

# Effect of present use of online transactions on attitude toward electronic medical record

Online transactions	All	Child web-based medical record		Own web-based medical record	
		Yes n (%)	No n (%)	Yes n (%)	No n (%)
Online shopping		nonsig		<b>p&lt;0.01</b>	
Never	191 (48.6%)	137 (71.7)	53 (27.7)	111 ( <b>58.1</b> )	80 ( <b>41.9</b> )
Have before, never again	8 (2.0%)	6 (75.0)	2 (25.0)	2 ( <b>25.0</b> )	6 ( <b>75</b> )
Have before, will again	194 (49.4%)	140 (72.2)	54 (27.8)	151 ( <b>77.8</b> )	40 ( <b>20.6</b> )
Total	393 (100%)	283	109	264	126
Online banking		nonsig		<b>p&lt;0.01</b>	
Never	152 (38.8%)	106 (69.7)	45 (29.6)	79 ( <b>52.0</b> )	73 ( <b>48</b> )
Have before, never again	3 (0.8%)	2 (66.7)	1 (33.3)	1 ( <b>33.3</b> )	2 ( <b>66.7</b> )
Have before, will again	237 (60.5%)	174 (73.4)	63 (26.6)	183 ( <b>77.2</b> )	51 ( <b>21.5</b> )
Total	392 (100%)	282	109	263	126
Online pay		nonsig		<b>p&lt;0.01</b>	
Never	176 (44.8%)	124 (70.5)	51 (29.0)	92 ( <b>52.3</b> )	84 ( <b>47.7</b> )
Have before, never again	2 (0.5%)	1 (50)	1 (50)	1 ( <b>50</b> )	1 ( <b>50</b> )
Have before, will again	215 (54.7%)	158 (73.5)	57 (26.5)	171 ( <b>79.5</b> )	41 ( <b>19.1</b> )
Total	393 (100%)	283	109	264	126

# So what really affects attitude toward web-based medical records?

## Logarithmic regression results

Significant factors	Web-based medical record for child		Web-based medical record for self	
	Significance level	Odds	Significance level	Odds
No internet connection at home vs internet connection at home	nonsig	-	0.033	0.512
Use of internet < 5 hours per week vs use of internet 5+ hours per week	0.01	0.496	nonsig	-
No use of online transactions vs use of online transactions	0.026	2.039	<0.01	0.283
Does not want web-based record created for self vs wants web-based medical record created for self	<0.01	0.230	n/a	n/a
Does not want web-based record created for child vs wants web-based medical record created for self	n/a	n/a	<0.01	0.246

# Summary

- Multicentre study into the attitudes of current health care users
- First study of its kind in Australia
- Support for web-based medical records
- Personal record strongly linked with internet usage and finances
- Child's record linked with internet usage but negatively associated with online transactions

# Strengths and Limitations

- Multicentre
- Large sample size
- Demographics in keeping with ABS statistics
- Results in keeping with that quoted in international studies
- Non-randomised
- Response rate unknown
- 92% of respondents identified English as their first language