

*Telehealth Services in the home  
improve healthcare outcomes and  
reduce costs – a review of the  
evidence*



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*Innovation and Excellence in Telehealth*

## The TeleMedCare Group


- Internationally recognised for its research and innovation in telehealth
- A deep pool of IP, expertise and know-how based on more than ten years of R&D at the University of NSW
- A large range of innovative telehealth products
- Australia's most recognised "brand" in telehealth products and services
- In commercial operation since July 2005
- Internationally competitive
- Widely respected in Australia and internationally



 THE UNIVERSITY OF  
NEW SOUTH WALES


## The Origins: The Biomedical Systems Laboratory

- Australia's top Biomedical Engineering Research Laboratory with more than \$4.5 million of current competitive research grants (2004-2008)
- Acknowledged international thought leader and innovator in telehealth and home telecare since 1992
- Relationship with **Telemedcare Pty Ltd**
  - Telemedcare has a Research Management Agreement that allows early stage R&D to be carried out in the BSL
  - Telemedcare deploys its research funds most effectively by applying and winning National Competitive Grants such as the Australian Research Council Industry Linkage grant scheme.
  - Transfer of IP to Telemedcare is regulated by the Research management Agreement

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## Externally funded R&D Activities

- Commercial Ready Grant - April 2006 - **\$1,700,983**
  - *Telehealth platform for self management of health and chronic disease*
- Commercial Ready Grant - July 2006 - **\$249,883**
  - *Wearable Energy Monitor for the Management of Obesity and Diabetes*
- NH&MRC Development Grant, April 2006 - **\$200,000**
  - *Development of a wearable triaxial accelerometer with embedded algorithms to detect and prevent falls in the frail elderly*
- NSW Government BioBusiness Proof of Concept Grant, 2007 - **\$100,000**
  - *PreventaFall + A Personal Alarm Response System for Falls Monitoring and Prevention*
- ARC Linkage Grant, 2008 - \$571,000+\$285,000 = **\$856,000**
  - *Design of an electronic guideline driven decision support framework for home and community telehealth settings*
- ARC Linkage Grant, 2008 - \$461,000+\$120,000 = **\$581,000**
  - *Development of a multivariate physiologic state space analysis framework for characterising functional properties of the cardiovascular system*

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## TeleMedCare Deployments

- **Australia**
  - Austin Hospital, Loddon Mallee Health Alliance, Baptist Community Services (ACT), Uniting Care, Sundale, Charles Gairdner Hospital, Montefiore Nursing Homes, Western Sydney Area Health Service
- **United Kingdom**
  - Norfolk, Suffolk, Calderdale, Lancashire, West Susses, Durham, Easington, Darlington, Derby, Aberdeenshire and Leeds
- **New Zealand**
  - Lakes PHO (Turangi) and Kawerau PHO



## Philips announces release of National Study on home healthcare technology and telehealth

- This first-of-its-kind study gathered insights about the use of home care technology from nearly 1,000 agencies across the U.S.
- The study represented all major segments of home care: large and small, rural and urban, free-standing and hospital-based, and for profit and not-for-profit.
- Some of the results include:
  - 17.1% of agencies use some type of telehealth system. A much higher% of large agencies (32.0%) report that they provide telehealth services.
  - 88.6% report that telehealth led to an increase in quality outcomes:
  - 76.6% report a reduction in unplanned hospitalizations
  - 77.2% report a reduction in emergency room visits
  - 71.3% report that telehealth services improved patient satisfaction. No agency reported that it reduced patient satisfaction.
  - 3.9% state that less than one in ten patients refused a home telehealth system.

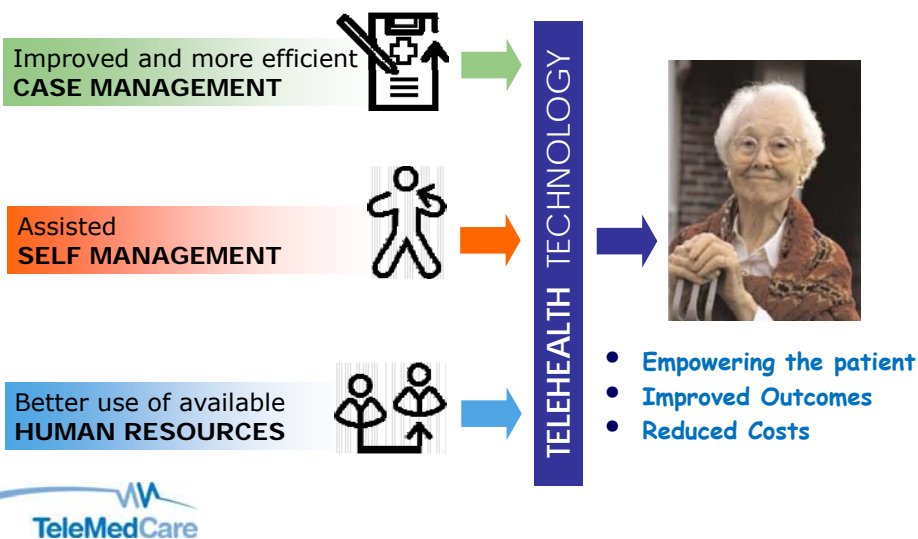


## Some Results - continued

- 79.2% of patients or family members were reluctant to have the telemonitoring system removed.
- 42.8% report that telehealth led to a reduction in cost. A similar number reported it as cost-neutral.
- 63.5% report that telehealth had no impact on clinical caseloads. As more agencies use telehealth and move up the learning curve, clinical productivity measures may increase
- 49.7% report telehealth decreased on-site visits
- 5.2% report telehealth increased the number of referrals
- 56.9% report that their nurses were very receptive to having a telehealth service after one year as compared to 36.3% at the beginning of the program.
- 89.1% stated that given everything they know today, they would still have started their telehealth program.



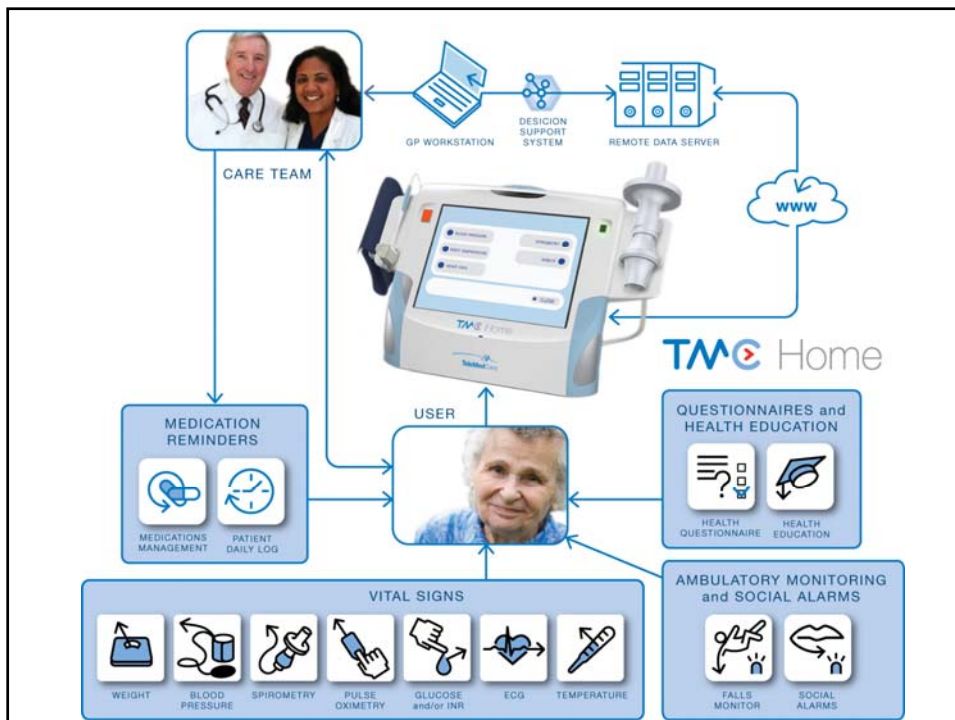

## The TMC three pillars of telehealth!



## Video Clip of Telemedcare @ Home

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VIDEO AVAILABLE ON DEMAND



## **Introducing** "wet lab" point of care diagnostic measurements

- Integration of full range of Roche Diagnostics point of care instruments and QA (Cobas) system;



**Cobas h 232 cardiac system**  
(cardiac profiling for Troponin T, NT-proBNP, D-dimer, CK-MB and Myoglobin)

**CoaguChek** (INR testing)

**Accu-Chek Performa** (glucose)

**AccuTrend Plus** (glucose, cholesterol, triglyceride and lactate) (Available Q1 2008)



## Integration Across Multiple Application Domains

- Chronic disease management at home and in the community
- Medications management and clinical monitoring in residential care
- Community health centre based telehealth services for rural and remote areas and developing countries
- Clinical monitoring in high risk OHS
  - Emergency services, transport industry, defence
- Falls monitoring, falls prevention, personal alarms
- Worried well, preventative health care
  - Early stage chronic disease, hypertension, COPD, overweight, obesity, diabetes, health and fitness



## TeleMedCare Desktop Products

- For Professional use (GP and Health Centres)
  - TMC Clinical and TMC PoCD
- For Residential care
  - TMC Care and TMC MEDSafe
- For the Home
  - TMC Home and Bluetooth devices with TeleHUB
- For Work and Health and Fitness
  - TMC OHS and TMC Health

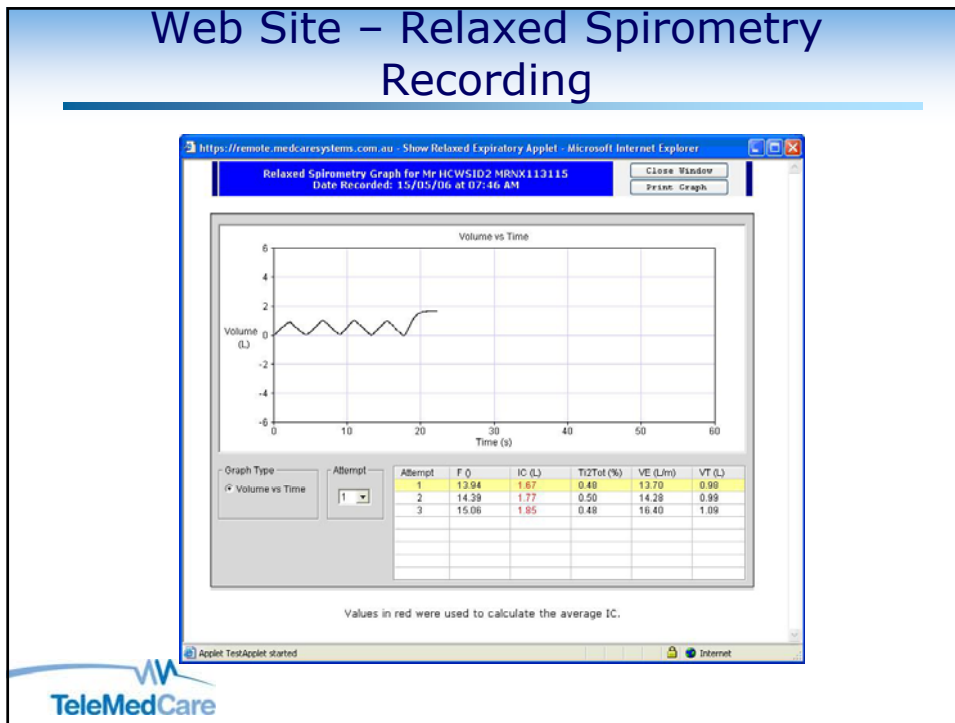


## TeleMedCare Clinical Excellence

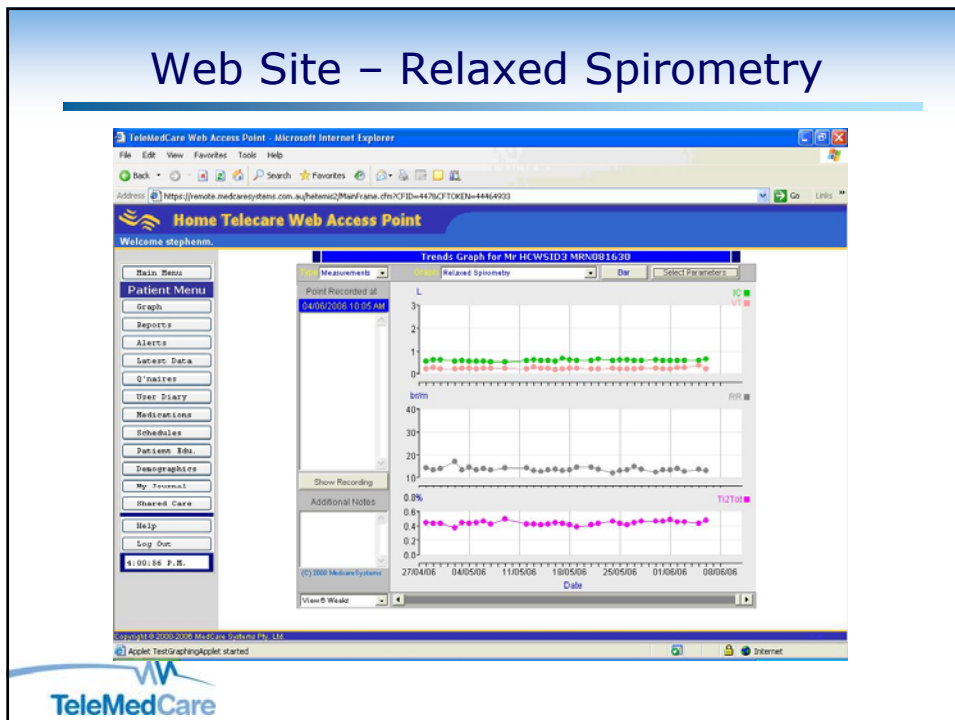
- Clinical Management
- Decision support



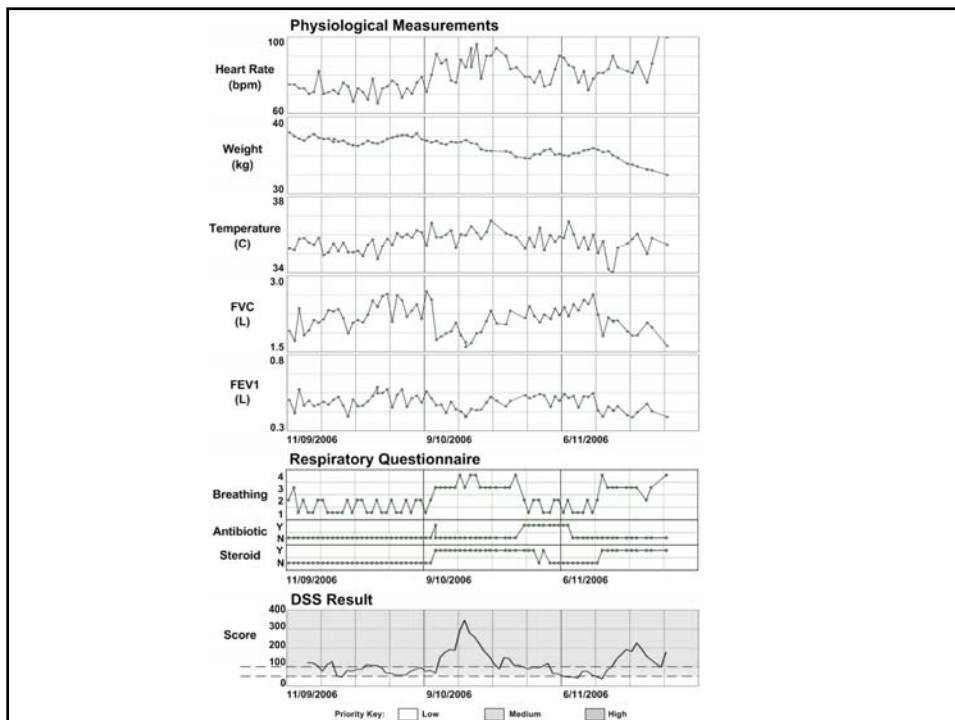
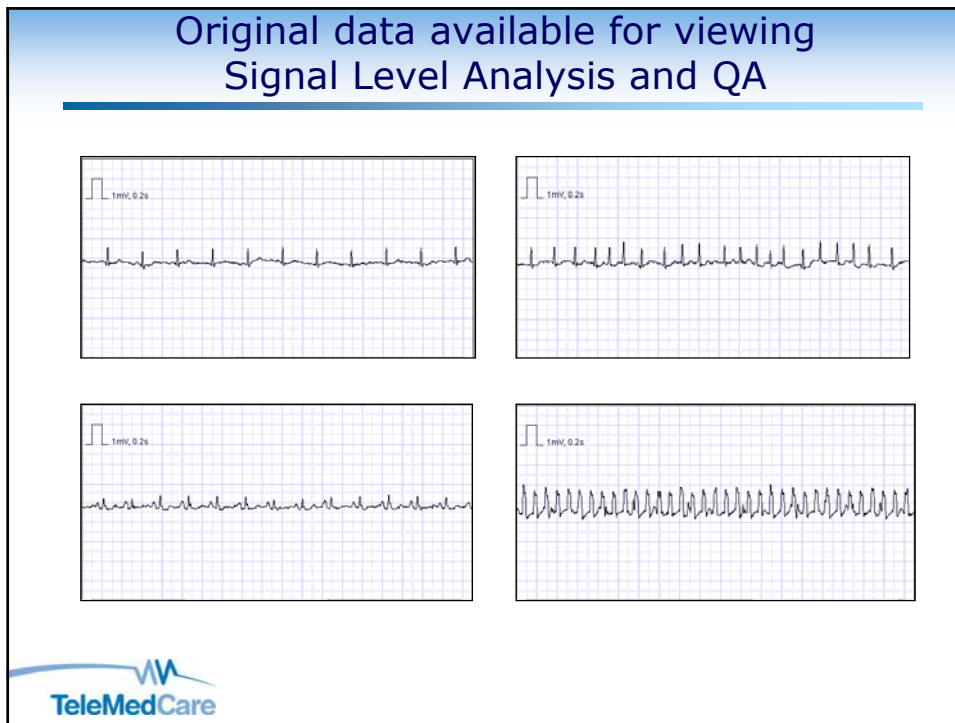
## Web Site – Relaxed Spirometry Recording

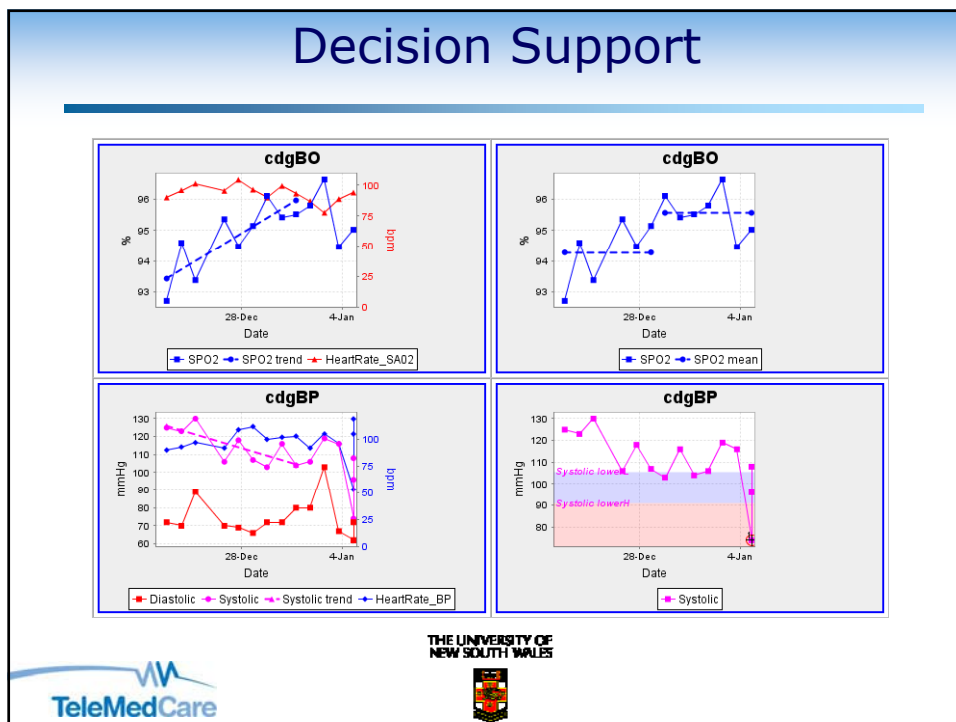
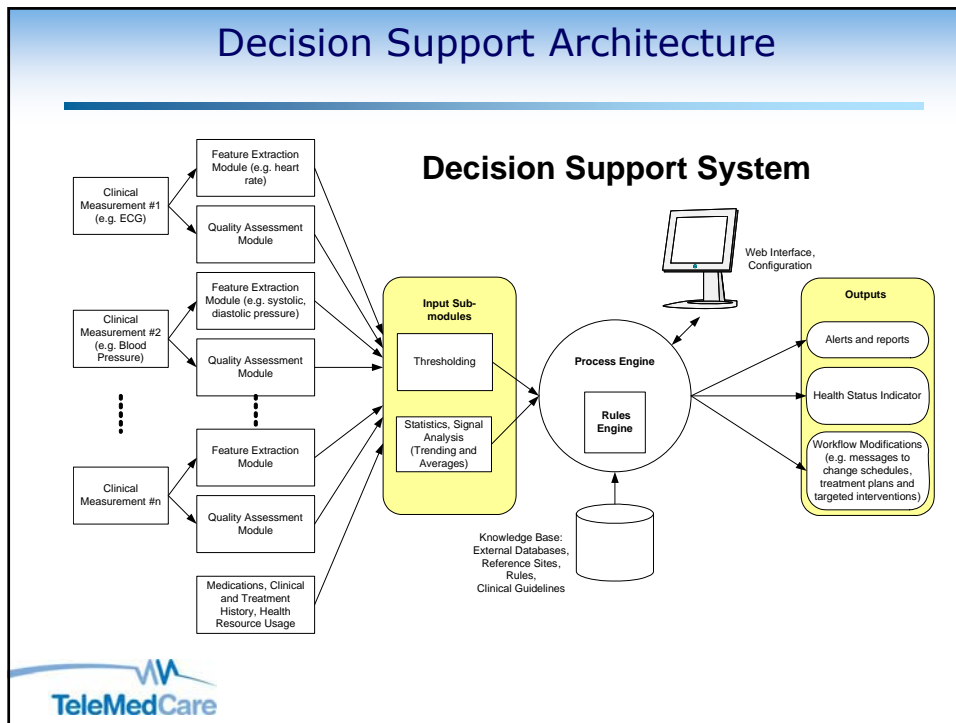


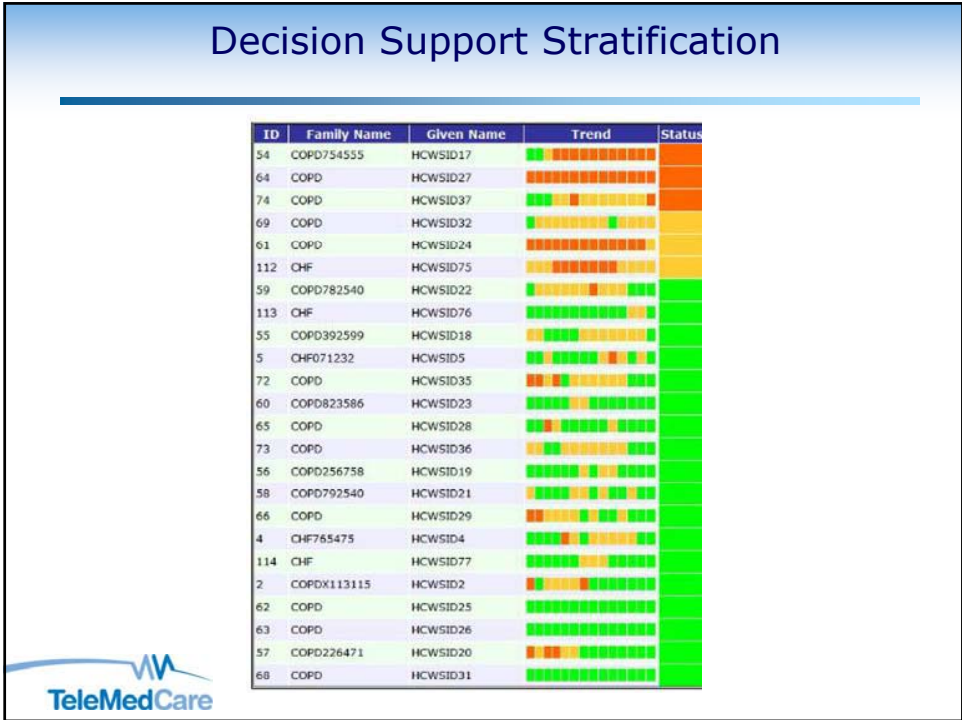
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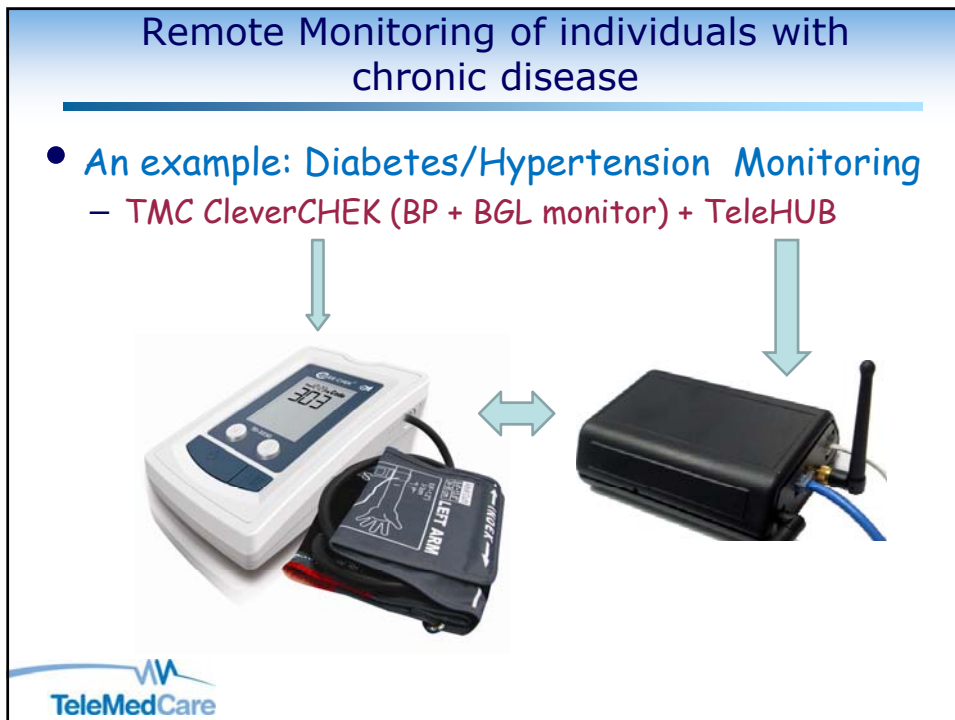








## TeleMedCare Mobile and Wireless Monitoring solutions



## The Business Case for Main Streaming Telehealth services?

*An example – Norfolk UK*

### The Norfolk/Norwich Tender

- Six companies responded - all but Telemedcare in the PASA framework.
  - Tunstall, Genesis Home Telehealth System supplying Hommed equipment from Honeywell
  - RSL Steeper supplying Doc@Home (Docobo) system and possibly the Care Companion from AMD
  - Philips Motiva - TV-based personalized healthcare platform for remote patient management (**Withdraw!**)
  - TBS GB supplying Aerotel equipment, Viterion equipment, Tesan and VNET internet based data handling applications
  - Initial Attendo supplying Doc@Home and Care Companion telehealth technology; medical videophone which allows visual contact with the patient allowing a remote virtual consultation with a client
  - TeleMedCare (UK) supplying Telemedcare @ Home home telecare systems and services



## A comprehensive product comparison: by patients, nurses and doctors

Criterion	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Telemedcare
Ease of use for clinician and patient	3.0	2.9	3.7	4.0	4.2
Access to, and quality of data	3.0	3.2	3.9	4.0	4.6
Functionality and application of equipment	2.7	3.3	3.9	3.8	4.6
Level of support is adequate and appropriate	3.1	3.0	3.4	4.2	4.5
Financial viability	3.0	3.3	2.9	3.4	4.1
Overall average	3.0	3.1	3.6	3.9	4.4

*Telemedcare was the most highly scored in EVERY category!*



## Following on from the Norfolk Tender....

- Continuing and expanding telehealth deployment in Norfolk
  - *Individual homes, general practices, residential care facilities, ...even the local jail!*
- Norfolk is rapidly become a bench mark demonstrator for the deployment of "*all of population telehealth solutions*" in the UK and the business model developed there is being distributed throughout the UK.
- Rapidly expanding market opportunities throughout the UK in residential care, community care and home telecare
- Falls projects in Calderdale, Derby and Southampton



## Some Preliminary Results provided by East Anglia University

	Visits to GP	GP visits to home	Phoned surgery	See nurse at surgery	Seen nurse at home
Pre Telehealth	90	24	51	9	8
Post Telehealth	45	20	42	5	1
Change	-50%	-16.7%	-17.6%	-44.4%	-87.5%
	Admissions to hospital		Bed days		
Pre Telehealth	10		40		
Post Telehealth	3		12*		
Change	-70%		-70%		

**Note:** N=13, 11 of the 12 bed days were within the first 3 Weeks of the telehealth technology being installed.



## West Norfolk

### New Model for Service Delivery

- **Precipitated by the following facts;**
  - Success of East Norfolk deployment
  - Request to local PCT for additional £3,000,000 in funds for additional community nursing
  - Strong support from UK Department of Health to develop new models of service delivery based on telehealth, that could be taken up by the other 151 Primary Care Trusts in the UK
  - Close (unusual?) collaboration between social services and health services in Norfolk



## The strategic process in detailing the components of the new model

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- Collection of existing demographics and performance data
- Details of what current resources are being deployed to deliver the existing service.
- The known costs in delivering the existing service
- The known improvement outcomes of assistive technology pilots and trials.
- A schedule of resources required to deliver the new model and the capacity it will be capable of managing
- An operational model that incorporates the following characteristics;



## Operational Model (1)

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- An assessment tool that delivers collaborative outcomes and referrals to the new services providers.
- A management centre where referrals are received and delivered.
- A management centre that installs, trains and supports individuals with assistive technology.
- A management centre that monitors social alarms and clinical information through an automated clinical decision support system to enable the filtering of need and the deployment of clinicians.





## Operational Model (2)

- A logistics model that will initially manage the deployment of community nurses in response to clinical trends and secondly to routine clinical services.
- A re-scheduling of routine vital sign measurements away from hospitals and GP surgeries.
- A resource base for early support of long term conditions using low cost wellness technology.
- A management centre to deliver assistive technology to registered care homes
- An audit tool to measure the performance of capacity against cost and the outcomes in terms of patient satisfaction and quality of life.



Evaluating current costs  
of established health service  
delivery

## REDUCTION OF HOSPITAL ADMISSIONS. Current model (1)

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- CHD and COPD patients over the age of 65 account for 20.6% of spells.
- The average tariff for each spell is 4 days x £325 ( 1,116 spells)
- Care homes in West Norfolk account for 10.5% of spells. The average tariff for each spell is 5 days x 325 (615 spells)
- CHD and CHF patients over the age of 65 accounted for 28.5% of readmissions. (2 spells)



## REDIRECTING INDIVIDUALS FOR VITAL SIGN TESTS. Current model (2)

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- Approximately 30% of community nurse time is spent taking vital signs or checking on the individual's condition.
- The cumulative cost of community nursing is approximately £3,102,544
- The estimated cost for routine vital sign measurement is £930,000



### COMMUNITY NURSES SUPPORTING PEOPLE AT HOME. Current model( <sup>3</sup> )

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- A community nurse supporting individuals with a chronic condition would have a case load of approximately 40 patients (cost £1,044 per patient).
- The average net cost per visit is £30.



### REDUCTION OF SOCIAL CARE ADMISSIONS TO CARE HOMES. Current model ( <sup>4</sup> )

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- NCC have a strategy in place to reduce care home purchasing by 3%.
- One of the initiatives is to deploy telecare technology to support people at home longer and better manage their condition. In 2004 there were 1,085 long term placements in West Norfolk.
- The anticipated outcome is that assistive technology would reduce this number by at least the target figure of 3% giving -32.5 placements at an average cost of £19,500 per placement.



### TRANSFER OF NON ELECTIVE CARE FROM HOSPITAL. Current model (5)

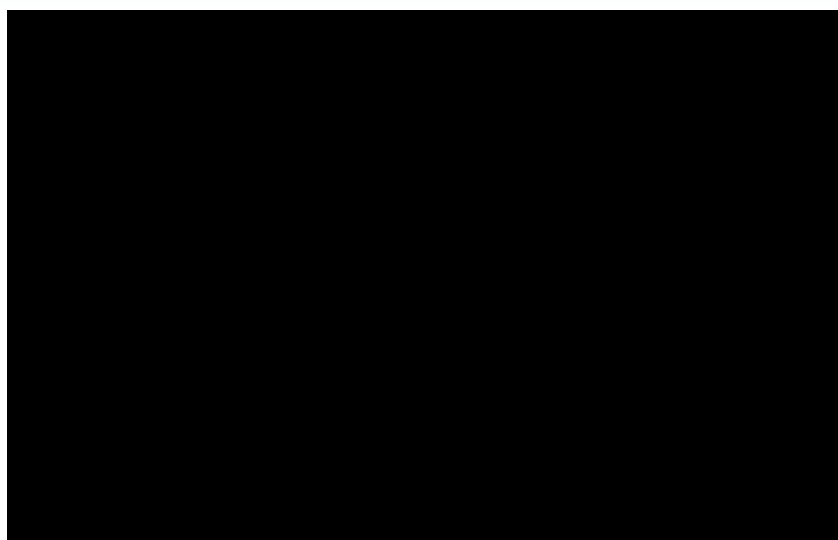
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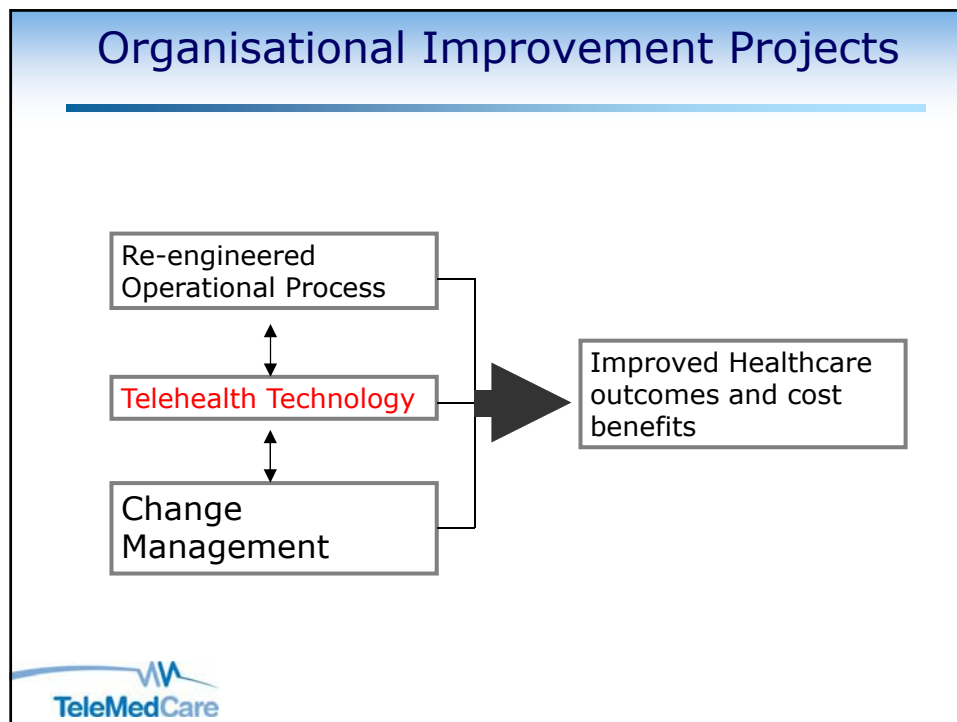
- 422 spells in hospital occurred in hospital that could have been managed in alternative settings, this accounts for approximately 7.2% of spells but 38.5% of bed days.
- It is estimated that the average stay for each spell for this group is 20 days x £325 (patients in this group are over the age of 60)



### West Norfolk – Funding Model

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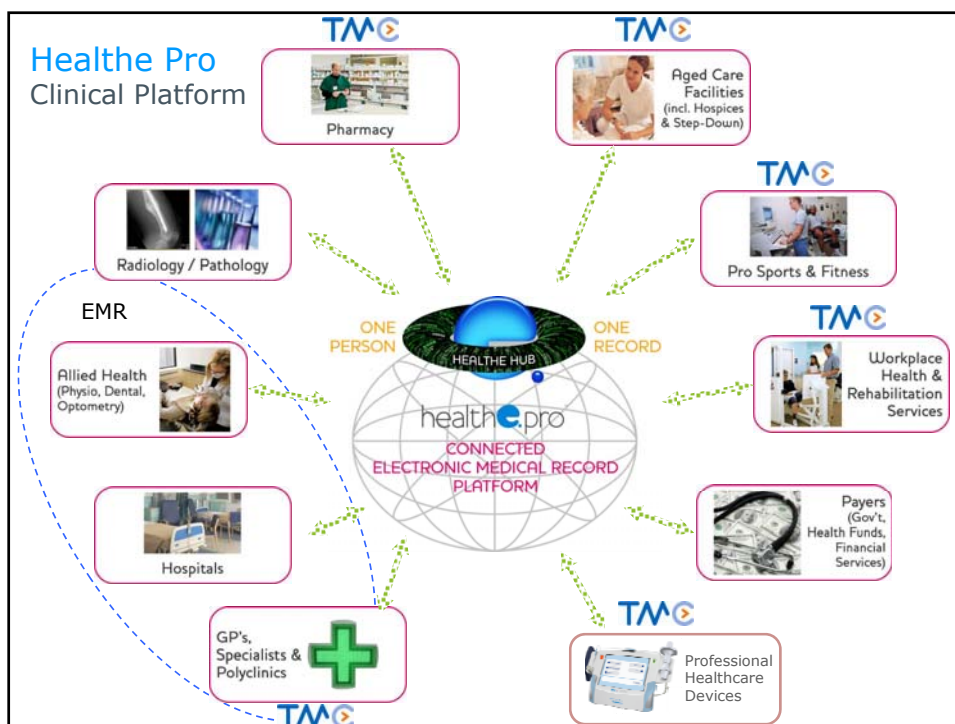




- ### Strategies for deployment of telehealth technologies
- Take a "population health" approach to determine the requirements for that community
  - Undertake risk stratification of potential clients
    - By severity of symptoms and quality of life
    - By likely clinical outcomes
    - By frequency of admission to hospital
  - THEN select optimal blend of telehealth technologies to achieve;
    - Best patient healthcare outcome
    - Best cost benefit
  - ONE product (..and cost!) does not fit all - it costs more to keep the "frequent flyer" out of hospital but the cost benefits can be much larger!
- The TeleMedCare logo is visible in the bottom left corner of the slide.

## A vision for the future of telehealth

- A mainstream, all of population approach, spanning all community sectors and domains
- The availability of care assessment tools that can risk stratify patients, identify the best available monitoring technology, monitor patient performance and assess outcomes
- Embedded, routine health economic evaluation
- Availability of detailed business plans and training aids for the deployment of telehealth services everywhere



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**Any  
Questions?**