Web-based Vital Signs Monitoring and Early Warning/Detection System for Hospitalised Older Adult Patients

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1 Wireless Medical Devices

1. Set-top-box: Receives and transmits over a secure internet connection.
2. Bluetooth BP monitor: Measures BP and pulse rate.
3. Bluetooth Pulse Oximeter: Nonin's Onyx II records SpO2 and HR.
4. Wireless Blood glucose meter: Accu-Chek Compact plus records glucose level.
5. Ear temperature: Omron's instant ear temperature measurement device.
6. Wireless Body temperature: G-plus for continues temperature measurement.
7. Wireless infrared Spirometer: nSpire's Piko-6 measures forced expiratory volume.
8. Accelerometer/Magnetometer: Gulf Coasts Data Concept's X8M-3mini.

Wireless medical devices used in the proposed patient monitoring system.

VitelMed – Patient monitoring and tele-healthcare system .

2 Proposed System Highlights

✓ *Wireless Vital Signs Data Collection*

Collects data using latest, wireless, off-the-shelve medical devices.

✓ *Connecting Patients and Clinicians*

Provides a user friendly software application, which can be installed on any PC or laptop with audio and video links, for connecting with medical professionals.

✓ *Access to Medical Record*

Incorporates current data with electronic medical records.

✓ *Portability and Compatibility*

The diagnostic module reads data file, converts to a readable format for batch processing.

✓ *Early Warning/alert Classifier*

Interprets and classifies data in association with a diagnosis concept such as: 'Hypertension' and 'Hypotension'.

3 Vital Signs & Relationship

Physical Signs/Parameters	Heart Rate	Blood Pressure	Pulse Rate	Oxygen Saturation	Temperature
Bradycardia	L	N/A	N/A	N/A	N/A
Tachycardia	H	N/A	N/A	N or L	N/A
Hypotension	N/A	L	L or N	N/A	N/A
Hypertension	N/A	H	Usually N	N/A	N/A
Hypoxaemia	N/A	N/A	N/A	Often L	N/A
Fever	H or N	N/A	N or L	N/A	H
Hypothermia	L	N or L	L	N/A	L
Normal Range	60-90 bpm	100-140/60-80 mm/Hg	60-100 bpm	94%-99%	36.5-37.5 ^{0}C

4 Conclusion

- The results show high acceptance of the proposed solution among the users.
- The system was validated with different set of collected data from 20 hospitalised older adults.
- Achieved an accuracy of 95.83%, sensitivity of 100%, specificity of 93.15%, and predictability of 90.38% in compare with a clinician assessment for tachycardia, hypertension, hypotension, hypoxemia and hypothermia.

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