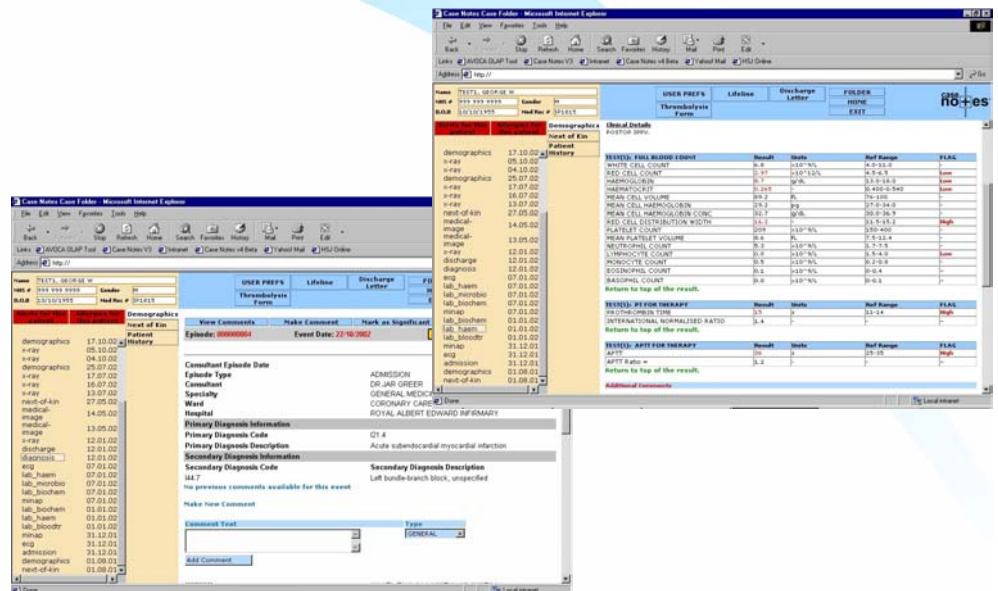


## Case Study:

# Wrightington, Wigan & Leigh NHS Trust

Implementing an effective, user-friendly e-technology solution for the National Service Framework for Coronary Heart Disease



The screenshot displays a medical software interface with the following sections:

- Demographics:**
  - name: 7377, 602038 W
  - sex: M
  - dob: 01/01/1953
  - marital: M
  - religion: C
  - ethnicity: W
- Medical History:**
  - heart of kin: 17.10.02
  - demographics: 05.10.02
  - demographics: 04.10.02
  - demographics: 25.07.02
  - demographics: 17.07.02
  - demographics: 16.07.02
  - demographics: 13.07.02
  - demographics: 07.01.02
  - medic: 14.05.02
  - image: 13.05.02
  - discharge: 12.01.02
  - diagnosis: 12.01.02
  - img: 07.01.02
  - lab\_name: 07.01.02
  - lab\_microbio: 07.01.02
  - lab\_biochem: 07.01.02
  - img: 07.01.02
  - lab\_name: 03.01.02
  - lab\_biochem: 03.01.02
  - img: 31.12.01
  - admission: 31.12.01
  - demographics: 01.08.01
  - med-of-kin: 01.08.01
- Consultant Episode Date:** 22/10/2002
- Consultant:** DR JAR GREER
- Speciality:** GENERAL MEDICINE
- Ward:** CORONARY CARE
- Hospital:** ROYAL ALBERT EDWARD INFIRMARY
- Primary Diagnosis Code:** I21.4
- Primary Diagnosis Description:** Acute subendocardial myocardial infarction
- Secondary Diagnosis Code:** I42.7
- Secondary Diagnosis Description:** Left bundle-branch block, unspecified

**Lab Results Summary:**

TEST	Result	Units	Ref Range	FLAG
WHITE CELL COUNT	8.8	10 <sup>9</sup> /L	4.0-10.0	Low
RED CELL COUNT	5.37	10 <sup>12</sup> /L	5.0-6.1	Low
HAEMOGLOBIN	6.7	g/dL	13.0-16.0	Low
HAEMATOCRIT	0.208	L	0.400-0.500	Low
MEAN CELL VOLUME	89.2	fL	80-100	Low
MEAN CELL HAEMOGLOBIN	75.7	pg	27-32.0	Low
MEAN CELL HAEMOGLOBIN CONC	85.2	g/dL	32.0-36.0	Low
RED CELL DISTRIBUTION WIDTH	14.1	%	11.5-14.5	Low
PLATELET COUNT	109	10 <sup>9</sup> /L	150-400	Low
MEAN PLATELET VOLUME	6.6	fL	9.0-11.0	Low
PLATELET COUNT	9.3	10 <sup>9</sup> /L	1.3-1.5	Low
LYMPHOCYTE COUNT	0.0	10 <sup>9</sup> /L	1.0-4.0	Low
MONOCYTE COUNT	0.0	10 <sup>9</sup> /L	0.2-0.8	Low
EOSINOPHIL COUNT	0.0	10 <sup>9</sup> /L	0.0-0.4	Low
NEUTROPHIL COUNT	0.0	10 <sup>9</sup> /L	0.0-0.8	Low

**TESTS: BEFORE THERAPY:**

TEST	Result	Units	Ref Range	FLAG
INTERNATIONAL NORMALIZED RATIO	1.4		1.0-1.5	High

**TESTS: AFTER THERAPY:**

TEST	Result	Units	Ref Range	FLAG
APTT	30	s	25-35	High
APTT Ratio	1.2			

# Wrightington, Wigan & Leigh NHS Trust

CSW Health, a leading supplier of XML-based solutions for health records management, successfully implemented CSW Case Notes™ at Wrightington, Wigan & Leigh NHS Trust in May 2002. By June of the same year, the Trust had rolled-out its first system using Case Notes - an effective and user-friendly e-technology solution to aid the assessment and treatment of acute coronary care patients.

## The Challenge

The Trust required an e-technology solution for acute coronary care to maximise CHD data quality and completeness, and subsequently, to make this information accessible to the clinicians via a responsive, easy to use, browser-based clinical workstation.

It was essential that members of the acute coronary care MDT were consulted and fully involved in every stage of the project. A study of the patient journey was completed in order

to understand how to collect CHD information effectively. Clinicians were also involved in designing the format for presenting the CHD electronic case notes for the new system.

## The Technology

The solution, based on CSW Case Notes™ was implemented at minimal cost using existing IT budgets and the funding obtained from winning a Service Improvement Team (SIT) award.

Case Notes has been designed in alignment with the Government's Interoperability Framework (e-GIF), which has been shaped by three key policy decisions:

1. Alignment with the Internet
2. Adoption of XML
3. A web browser as the user interface



The screenshot displays the CSW Case Notes web application interface. The top navigation bar includes 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. The main content area is divided into several sections:

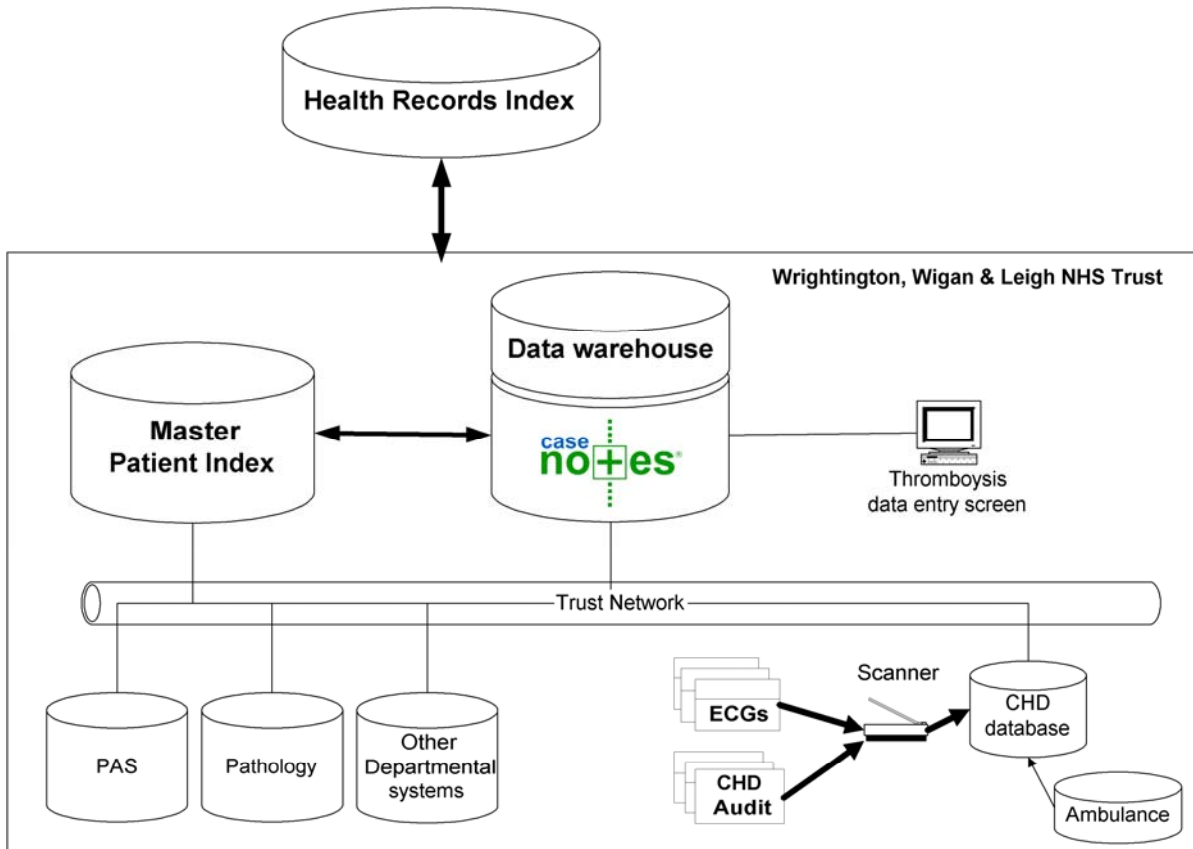
- Patient Information:** Name: TESTS, GEORGE W; NHS #: 999 999 9999; Gender: M; B.O.B: 02/10/1955; Head Rec #: 31515.
- Demographics:** A list of events including 'demographics', 'x-ray', 'next-of-kin', 'medical-image', 'discharge', 'diagnosis', 'egp', 'lab\_haem', 'lab\_microbio', 'lab\_biochem', 'menap', 'lab\_bloody', 'admission', and 'next-of-kin' with corresponding dates.
- Consultant Episode Data:** Episode: 000000004; Event Date: 22/10/2002.
- Primary Diagnosis Information:** Primary Diagnosis Code: I21.4; Primary Diagnosis Description: Acute subendocardial.
- Secondary Diagnosis Information:** Secondary Diagnosis Code: I47; Secondary Diagnosis Description: no previous comments available for this event.
- TESTS: FULL BLOOD COUNT:** A table showing results for various blood counts:
 

TESTS: FULL BLOOD COUNT	Result	Units	Ref Range	FLAG
WHITE CELL COUNT	8.8	10 <sup>9</sup> /W/L	4.0-11.0	?
RED CELL COUNT	5.97	10 <sup>12</sup> /W/L	4.5-5.5	Low
HAEMOGLOBIN	8.7	g/dL	13.0-18.0	Low
HAEMATOCRIT	31.6%	%	37.0-54.0	Low
MEAN CELL VOLUME	89.2	fL	76-100	?
MEAN CELL HAEMOGLOBIN	29.2	pg	27.0-34.0	?
MEAN CELL HAEMOGLOBIN CONC	32.7	g/dL	30.0-36.9	?
RED CELL DISTRIBUTION WIDTH	14.2	%	11.5-15.2	High
PLATELET COUNT	209	10 <sup>9</sup> /W/L	150-400	?
NEUTROPHIL COUNT	8.6	10 <sup>9</sup> /W/L	5.7-7.5	?
LYMPHOCYTE COUNT	0.8	10 <sup>9</sup> /W/L	1.5-4.0	?
MONOCYTE COUNT	0.5	10 <sup>9</sup> /W/L	0.2-0.8	?
EOSINOPHIL COUNT	0.1	10 <sup>9</sup> /W/L	0.0-0.4	?
BASOPHIL COUNT	0.0	10 <sup>9</sup> /W/L	0-0.1	?
- TESTS: PT FOR THERAPY:**

TESTS: PT FOR THERAPY	Result	Units	Ref Range	FLAG
PROTHROMBIN TIME	15	s	11-14	High
INTERNATIONAL NORMALISED RATIO	1.4			?
- TESTS: APTT FOR THERAPY:**

TESTS: APTT FOR THERAPY	Result	Units	Ref Range	FLAG
APTT	36	s	25-35	High
APTT Ratio =	1.2			?





**Fig 1. Architecture**

Case Notes uses open standards technology such as the eXtensible Markup Language (XML) and is fully extensible through a system of plug-in modules. These modules can be links to existing clinical systems or to CSW's own modules such as Discharge Letters, In-tray and Order Communications.

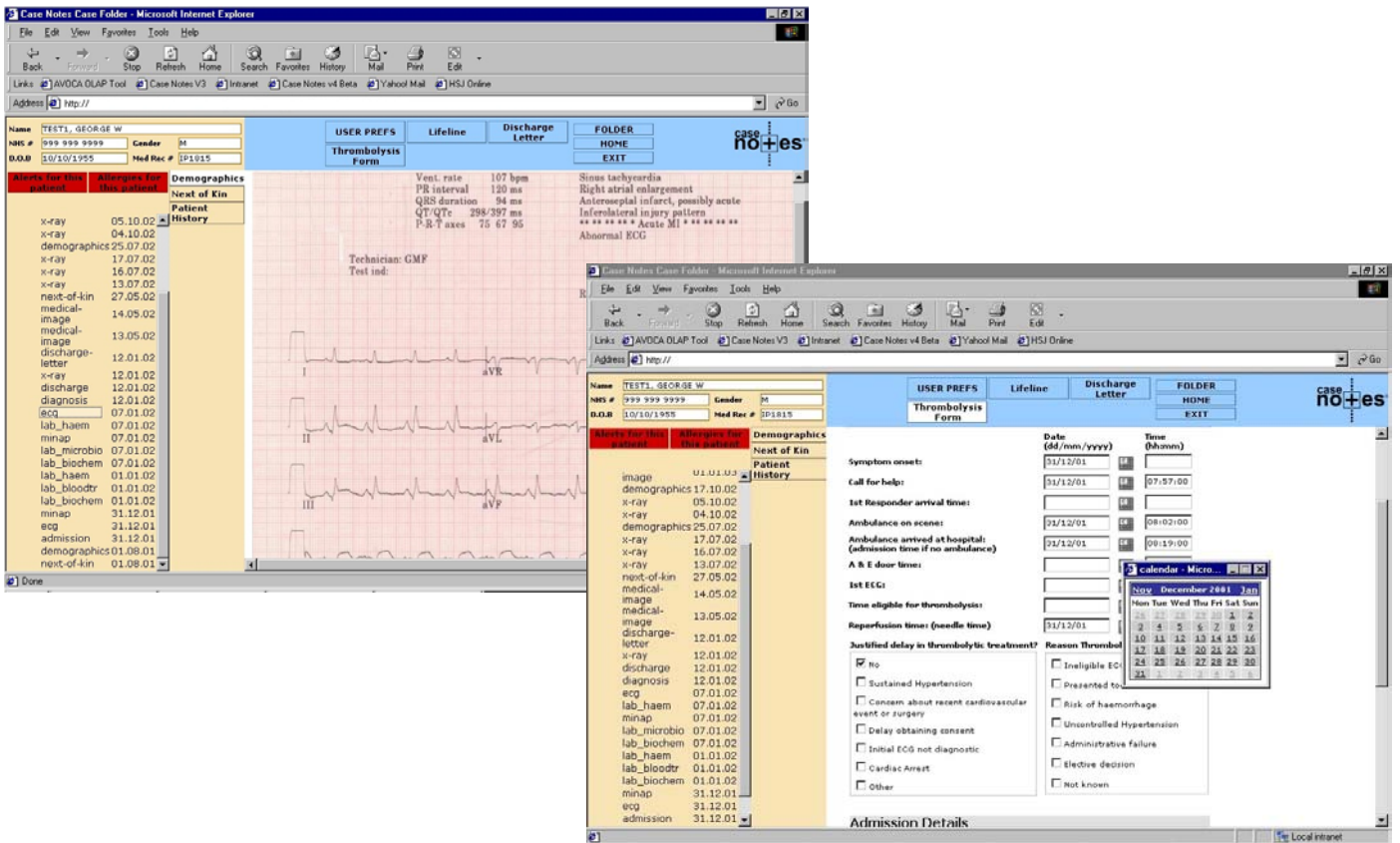
At Wigan, interfaces between the e-technology solution and departmental systems (including PAS ADT, Clinical coding, ECGs, Pathology and Cardiology outpatients) were developed in-house, making full use of CSW's flexible import module, and utilising NHS Standards such as e-GIF, XML, and HL7.

There is currently a great deal of enthusiasm, especially from local GPs, to link the acute and primary care databases to form a borough-wide

CHD register. The e-technology solution is designed to be accessible via the Health Records Index (HRI), or any browser-enabled device linked to the NHSnet, and, as such, it has already gone a long way towards achieving this objective.

### Results

By logging into CSW Case Notes™ clinicians are now able to access ECGs in seconds, rather than the hours it can take to recall case notes from medical records. Previous ECGs are used to assess a patient's eligibility for thrombolysis, and as such are a vital source of information for assessing patients for treatment within 30 minutes. Feedback from clinicians points to the fact that this will significantly improve patient care.



Any clinician in the acute coronary care multidisciplinary team (MDT) is now able to view Coronary Heart Disease (CHD) medical records in the form of electronic case notes. Clinicians have rapid access to a wide range of information, including PAS in-patient data, ECGs, the CHD minimum data set, diabetes information, pathology results, and patient alerts. When viewed as a single integrated electronic patient record, this e-technology solution provides clinicians with a very powerful National Service Framework (NSF) information resource.

The system also includes a data entry screen for nurses to key in thrombolysis treatment/door-to-needle times directly.

By making full use of CSW's web technology, these CHD electronic case notes are viewable in seconds, cross-referenced with acute coronary care information held on other systems (such as pathology results), and linked to evidence-based medicine via NHSnet and the National Electronic Library for Health (NeLH).

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