charmhealth
more than connectivity

Extracting Existing Usage-Data to Predict Future Requirements in Oncology and EMRs

Janine Garrett, Danielle Stowasser, Mark Fahey, Rich O'Connor, Lyn Clarke

Charm Health, Brisbane, Queensland

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

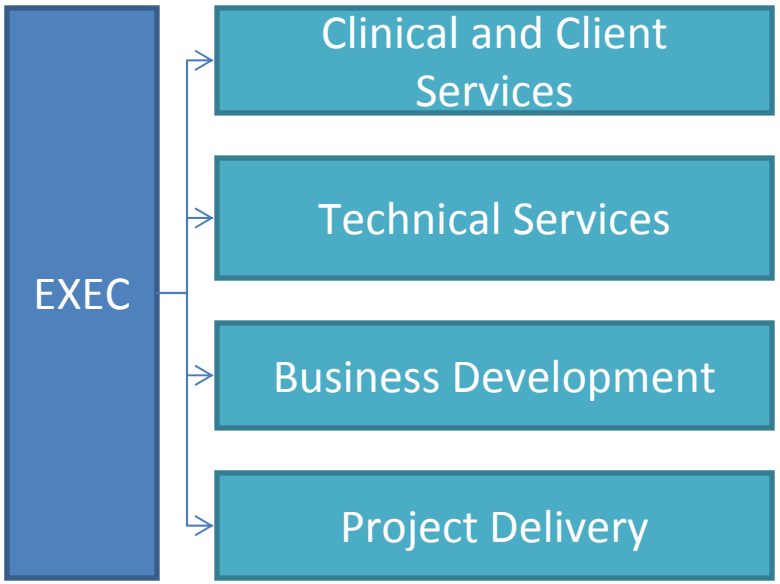
Overview

- Backgound
- CharmHealth
- Objectives
- Methods
- Results
- Future directions

Background – Charm Health

Queensland based - Founded in 2000

- 17 Facilities Live + 15 Facilities Implementing
- >700 Users
- ~20 Staff



Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

charmhealth
more than connectivity

Charm

- Originally in oncology
  - Additional functionality (eg scheduling)
- Medication management
- Expanded to radiation therapy
- Request for chronic disease management
  - Diabetes
  - Renal
  - Cardiac

Functionality

charmhealth
more than connectivity

- Chronic Disease Management Using Clinical Pathways
  - Chemotherapy
  - Radiotherapy
  - Combined Chemo/RT
  - Palliative Care
- Electronic Medical Record
  - Pathology/Radiology Orders &Results
  - Medical/Surgical History
  - Medication Management/Allergies
  - Device Management
- Document Management
  - Letter/Discharge Summary Writer
  - Imports scanned documents/images
- PBS Script Management
- Pharmacy Management
  - Manufacturing
  - External Orders
  - Invoice Matching
  - Finance Extract
- Clinical Trials Management
- Day Unit/Outpatient – Scheduling
- Radiotherapy
  - Prescription
  - Treatment History
  - Scheduling
- Billing
- Clinical Practice Guidelines
  - Summaries
  - Treatment Algorithms
- Decision Support
  - Drug: Drug/Disease/Allergy
- Multidisciplinary Clinic Support
- Data Collection
  - Cancer Staging
  - Registry Interfaces
  - Research
- Dynamic Content Collection/Reporting
  - Customisable Questionnaires
  - Custom Report Generation Tool
- Interfaces with
  - PAS/Scheduling Systems/Finance
  - Pharmacy/Radiotherapy
  - Pathology/Radiology

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

Objectives

- Charm Health is in the process of developing Charm.Next
- To take learnings from usage of existing software functionality in development of a new generation of software for oncology medication management, CDM and EMR

Methods

- Extracted de-identified data
- From routine reporting data repositories
- Analysed using basic descriptive statistics
- Functionality usage was then compared to functional specifications for:
  - oncology management
  - general disease management
  - EMR
  - medication management

to assess future requirements

charmhealth
more than connectivity

Results

- 48,000 patients
- Average age 66.1 ± 13.0
- 54.5% female
- 1,020,000 medications and blood products
- Average 20.9 medications per patient

charmhealth
more than connectivity

Functionality Usage

- Over 95% of medications associated with chemotherapy treatment
  - 32% chemotherapy
  - 39% management of nausea and vomiting
  - 6% rescue and management of immune-suppression
  - 0.3% antibiotics
  - 0.9% blood products
  - 19% associated administration (e.g. fluids and electrolytes)

charmhealth
more than connectivity

Key Points

- Target functionality is used most
- Functionality that reduces workload most commonly used
- Automation of complex (multistep) processes preferred
- Patient safety and errors of importance
- Communication paramount
- Use of additional functionality takes time

charmhealth
more than connectivity

Clinical Trials

- >30 clinical trial medications
- >100 protocols in clinical trial
- >1000 of doses
- Tracking is complex
- Financial incentive

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au


Charm - [Daily Diary]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Pathway Wizard - Step 4 of 7 - Select Pathway- Ms BUNNY, TEST
Pathway Wizard - Step 4 of 7 - Select Pathway
Select Pathway
Pathway Details
Modified Templates
Eligibility Criteria
Pathway
Description
Fit
Eligibility
Test
PW_N_Details//Description
100 %
Eligible Fit 2/2
1. Clinical Stage = IIIA
2
Methotrexate, Trial Drug
Methotrexate 10mg S/C weekly for 12 weeks;
Trial drug 50mg IVINF every 4 weeks
50 %
Eligible Fit 2/4
1
**NOT MET: ECOG Performance Status Score > 2
2. ECOG Performance Status Score < 2
**NOT EVALUATED: Approx Years Post Menopausal<
1
Adjuvant Breast Cancer Trial 0001
Cyclophosphamide 600mg/m^2 IVINF D1,15, 29, 43;
Doxorubicin 60mg/m^2 IVBOL D1,15, 29, 43;
50 %
Eligible Fit 2/4
**NOT EVALUATED: Tumour Marker 2= 1
[Progesterone Receptor Assay Positive or elevated]
Assess Patient for Eligibility Into a Clinical Trial View
Charm Health Breast Cancer trial
New Breast Cancer drug.
0 %
New Breast Cancer Drug
Screening pathway
0 %
Lapatinib (Trial)
Lapatinib 750 mg ORAL BD D 1-28.
0 %
Breastkill
Breastkill/Placebo 1500mg PO D1-90.
0 %
Cyclophosphamide-Doxorubicin (AC)x4 + Paclitaxelx4
AC x 4+Taxel x 4;
(Doxorubicin 60mg/m^2 IVBOL D1; Cyclophosphamide 600mg/m^2 IVINF D1. (AC)) x 4 +(Paclitaxel 175mg/m^2 IVINF D1) x 4.
0 %
5-Fluorouracil-Cyclophosphamide-Metho... (CMF (Oral))
5-Fluorouracil 600mg/m^2 IVBOL D1,8;
Cyclophosphamide 100mg/m^2 IVINF D1-14;
Methotrexate 40mg/m^2 IVBOL D1,8.
0 %
Gemcitabine-Paclitaxel
Gemcitabine 1000mg^2 IVINF D1, 8;
83 %
Eligible Fit 5/6
1
2
3. ECOG Performance Status Score < 2
Search Full List
Folder View
Eligibility View
Cancer Registry
Cancel
Back
Next
Finish
APRIL ABEL]
WF_PW_Select
Craig MOORE
Medical
TITANJOHN
Task Ma

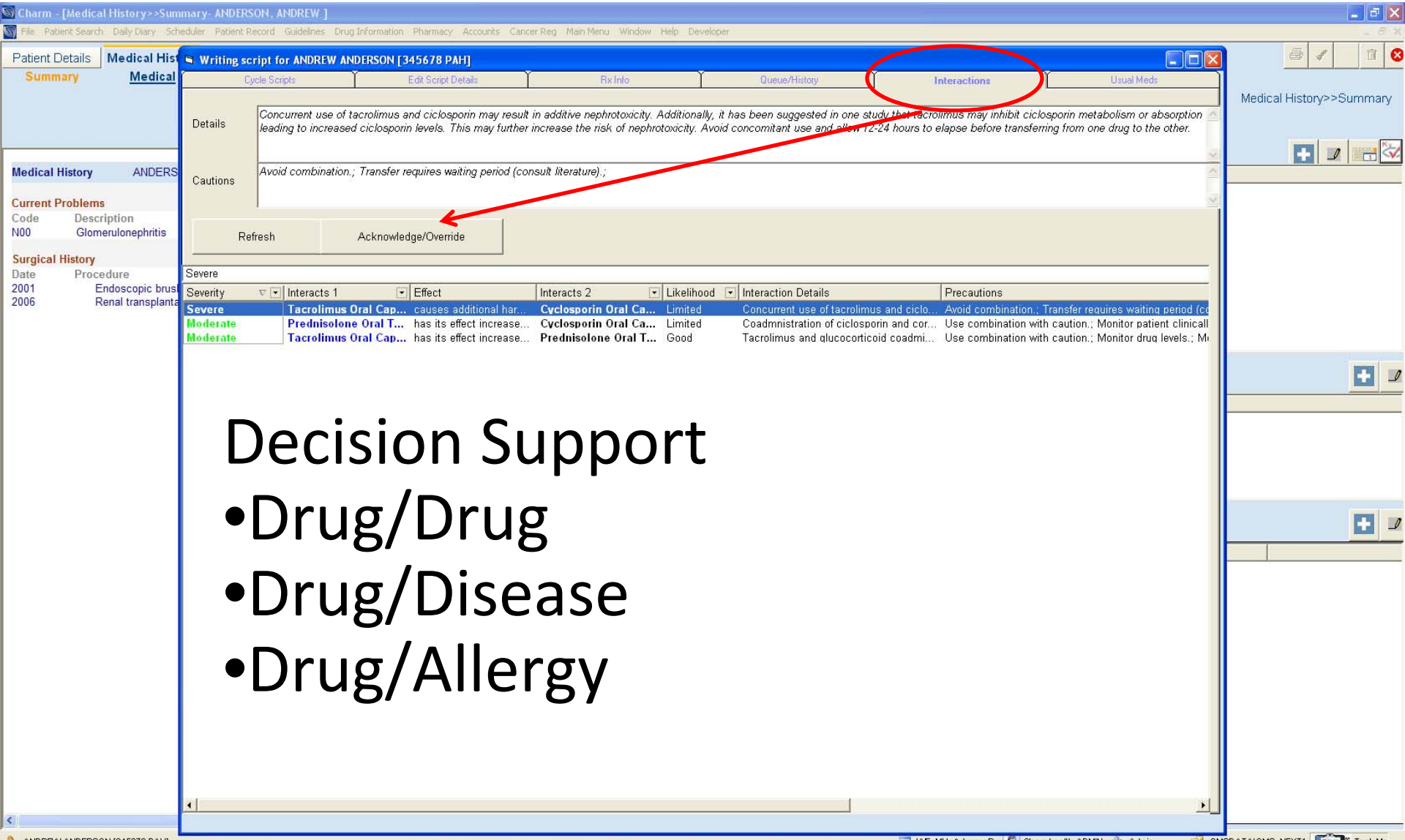
charmhealth
more than connectivity

Patient Safety Functionality

- Decision support, drug, allergy and disease interaction checking, was used in all sites
- Calculate and adjust dosages for renal function and body surface area was routinely used by all sites

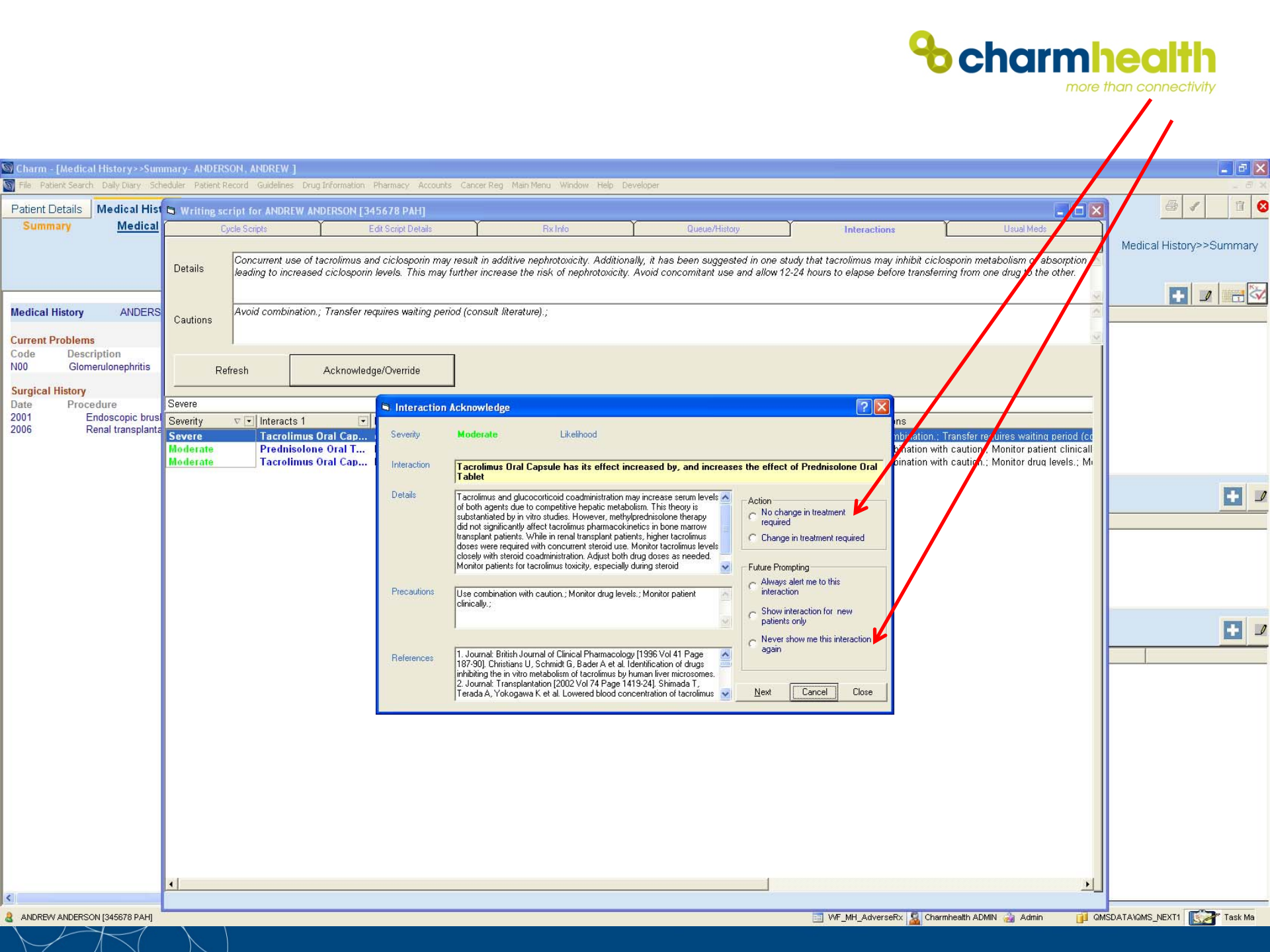
Interactions Checking

charmhealth
more than connectivity



Decision Support

- Drug/Drug
- Drug/Disease
- Drug/Allergy

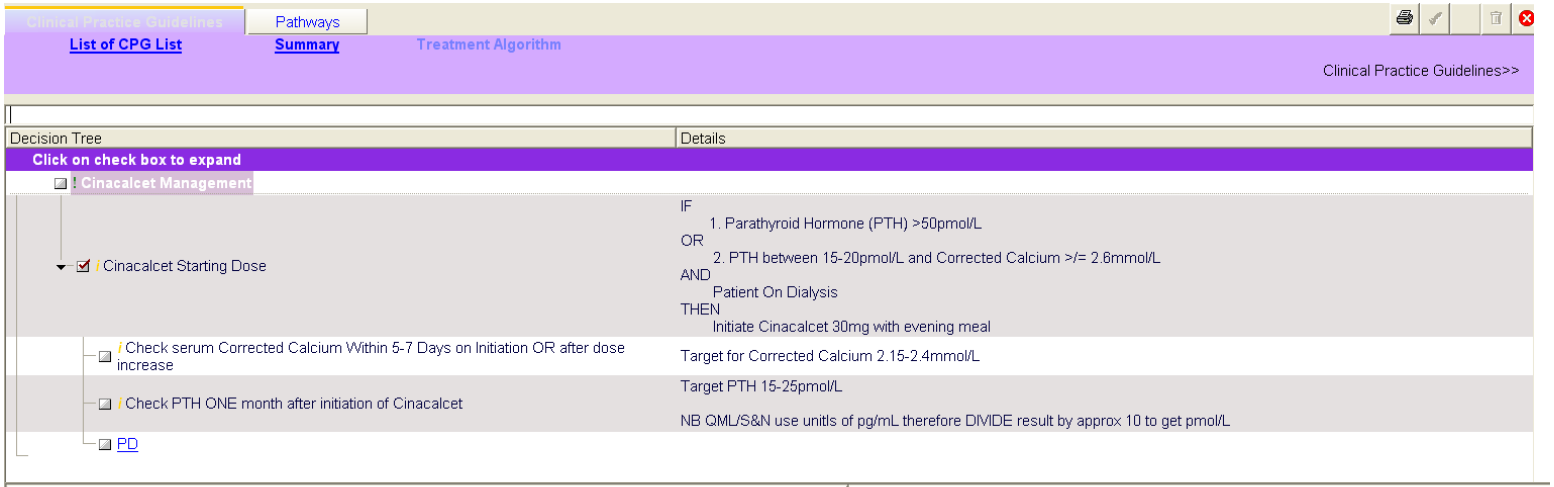

charmhealth
more than connectivity
Charm - [Medical History>>Summary- ANDERSON, ANDREW]
File Patient Search Daily Diary Scheduler Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details
Medical Hist
Summary
Medical
Writing script for ANDREW ANDERSON [345678 PAH]
Cycle Scripts
Edit Script Details
Rx Info
Queue/History
Interactions
Usual Meds
Medical History>>Summary
Details
Concurrent use of tacrolimus and ciclosporin may result in additive nephrotoxicity. Additionally, it has been suggested in one study that tacrolimus may inhibit ciclosporin metabolism or absorption leading to increased ciclosporin levels. This may further increase the risk of nephrotoxicity. Avoid concomitant use and allow 12-24 hours to elapse before transferring from one drug to the other.
Cautions
Avoid combination.; Transfer requires waiting period (consult literature).;
Refresh
Acknowledge/Override
Medical History
Current Problems
Code Description
N00 Glomerulonephritis
Surgical History
Date Procedure
2001 Endoscopic brus
2006 Renal transplanta
Severe
Severity
Interacts 1
Severe Tacrolimus Oral Cap...
Moderate Prednisolone Oral T...
Moderate Tacrolimus Oral Cap...
Interaction Acknowledge
Severity Moderate Likelihood
Interaction
Tacrolimus Oral Capsule has its effect increased by, and increases the effect of Prednisolone Oral Tablet
Details
Tacrolimus and glucocorticoid coadministration may increase serum levels of both agents due to competitive hepatic metabolism. This theory is substantiated by in vitro studies. However, methylprednisolone therapy did not significantly affect tacrolimus pharmacokinetics in bone marrow transplant patients. While in renal transplant patients, higher tacrolimus doses were required with concurrent steroid use. Monitor tacrolimus levels closely with steroid coadministration. Adjust both drug doses as needed. Monitor patients for tacrolimus toxicity, especially during steroid
Action
No change in treatment required
Change in treatment required
Future Prompting
Always alert me to this interaction
Show interaction for new patients only
Never show me this interaction again
Precautions
Use combination with caution.; Monitor drug levels.; Monitor patient clinically.;
References
1. Journal: British Journal of Clinical Pharmacology [1996 Vol 41 Page 187-90]. Christians U, Schmidt G, Bader A et al. Identification of drugs inhibiting the in vitro metabolism of tacrolimus by human liver microsomes. 2. Journal: Transplantation [2002 Vol 74 Page 1419-24]. Shimada T, Terada A, Yokogawa K et al. Lowered blood concentration of tacrolimus
Next
Cancel
Close
ANDREW ANDERSON [345678 PAH]
WF_MH_AdverseRx
Charmhealth ADMIN
Admin
QMSDATA\QMS_NEXT1
Task Ma

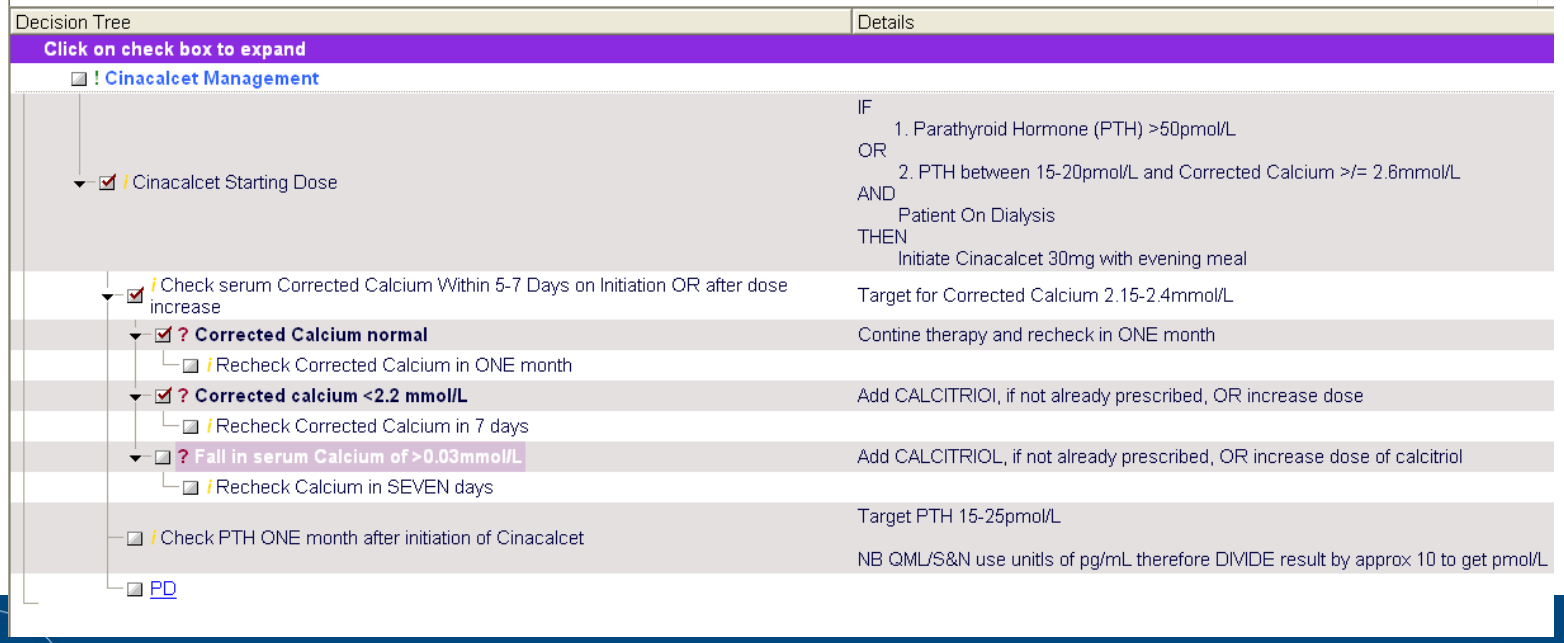
charmhealth
more than connectivity

Medication Management

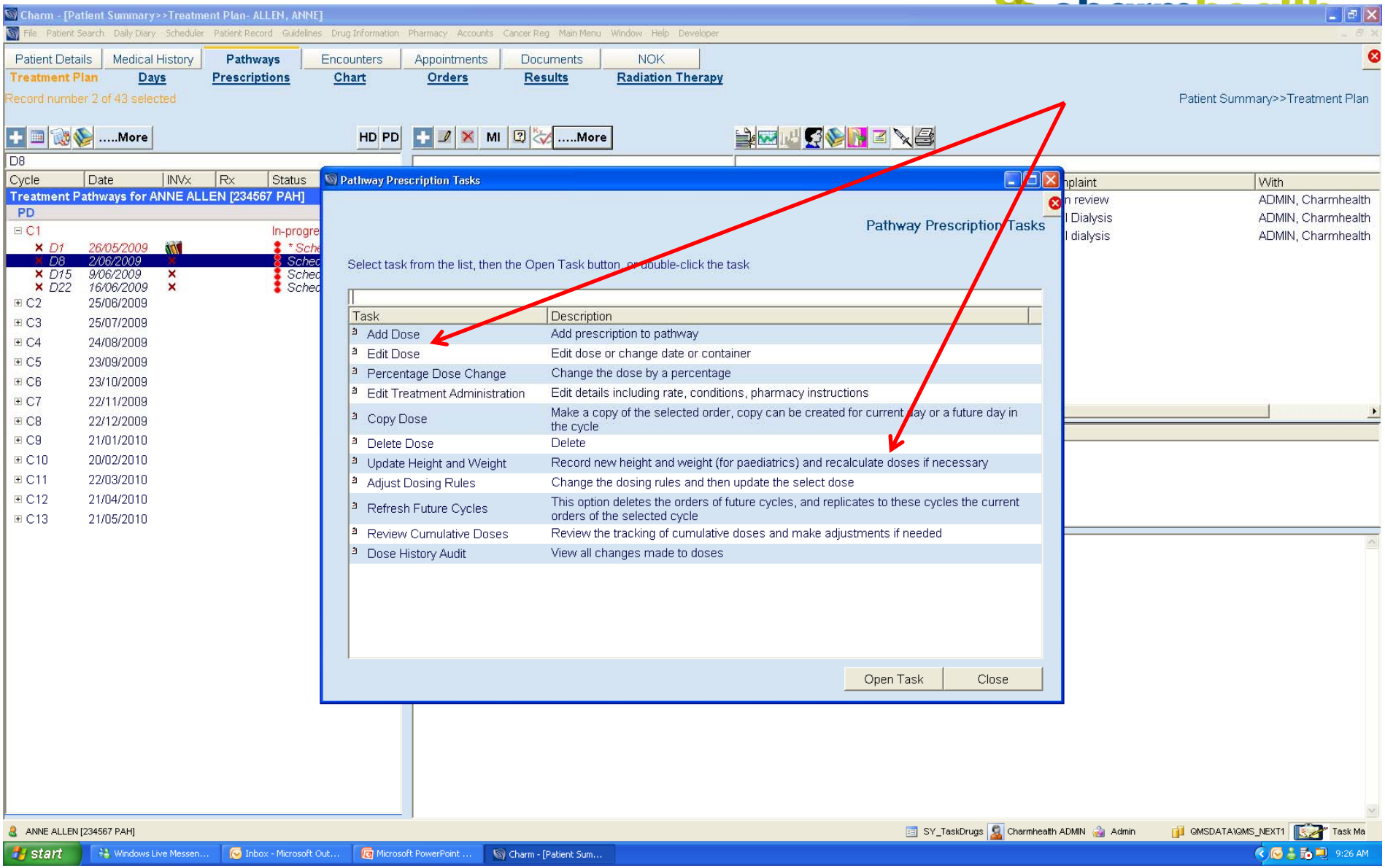
- Basic prescribing workflow
  - Medication Review
  - PBS Script Management
  - Complex Scheduling
    - Chemotherapy and Dialysis prescriptions
    - Oncology and Transplant pathways

Treatment Algorithms

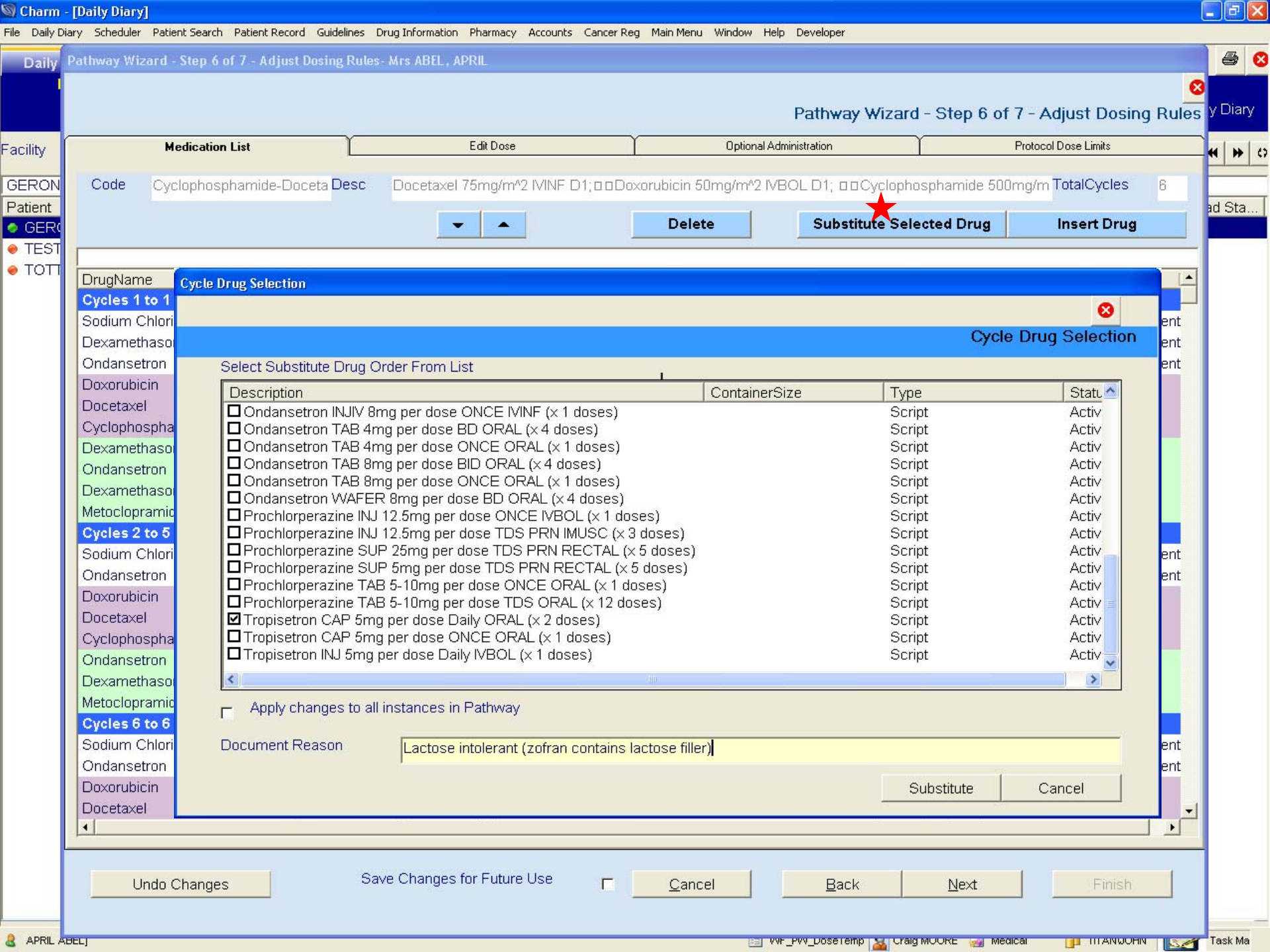


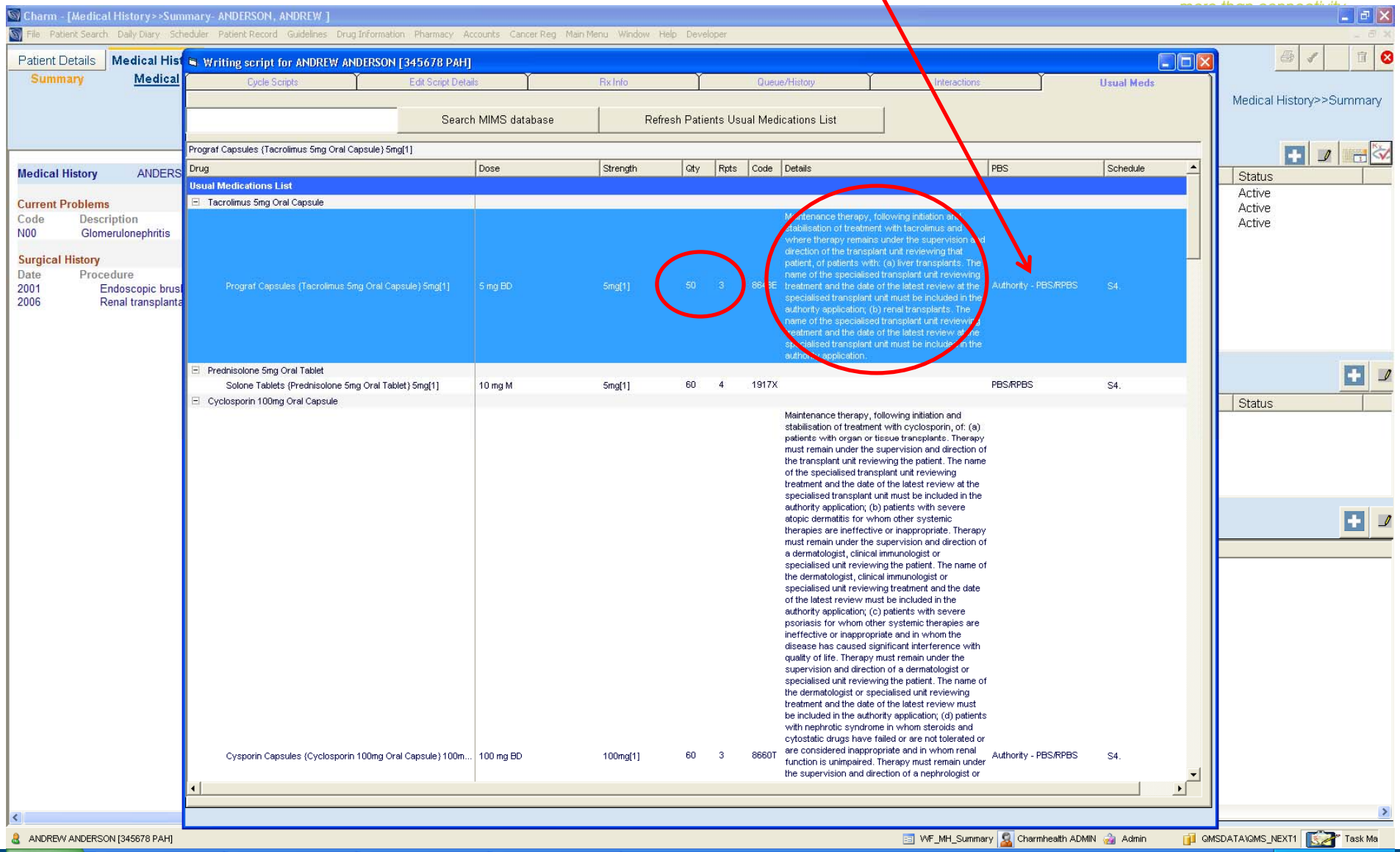


Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

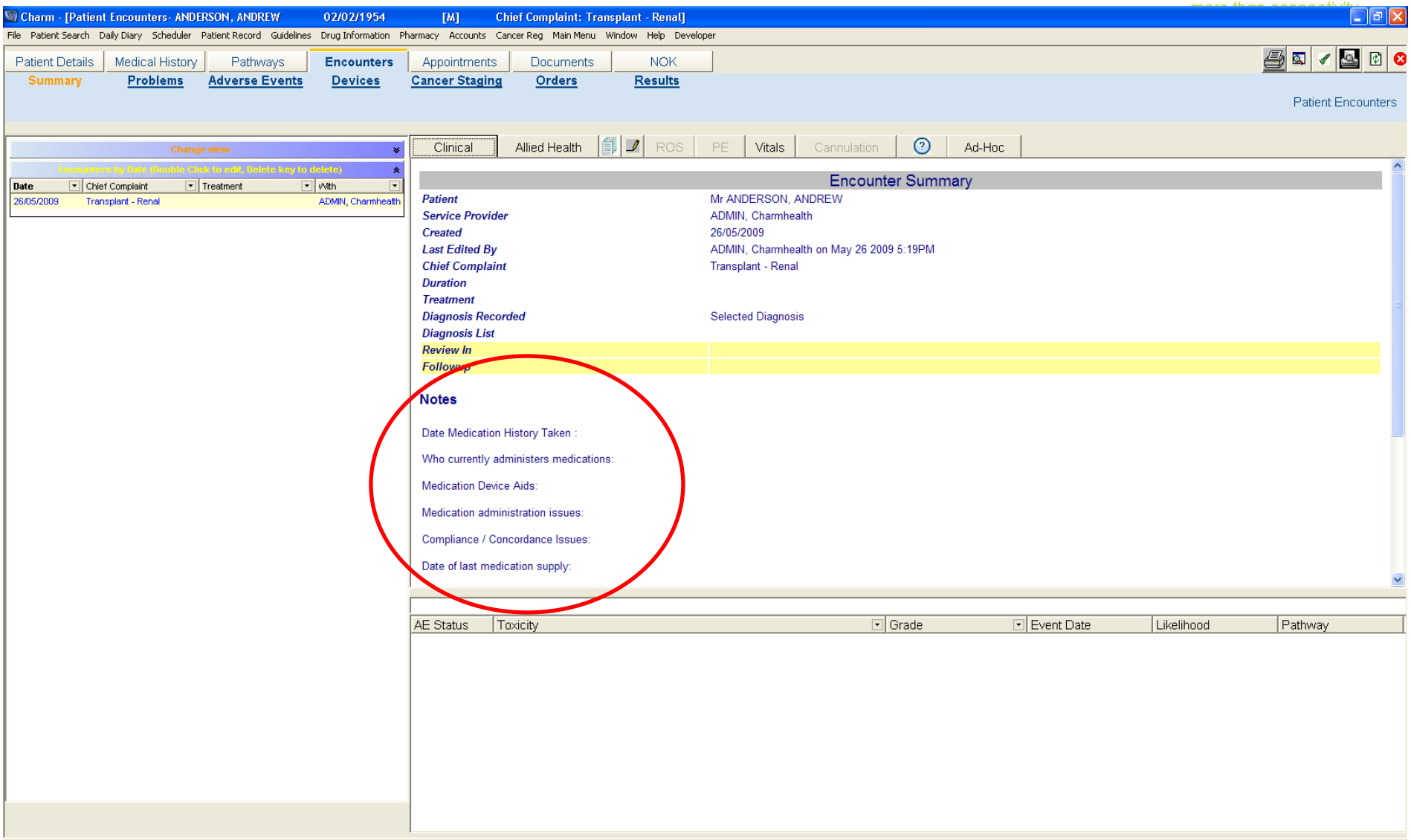


Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

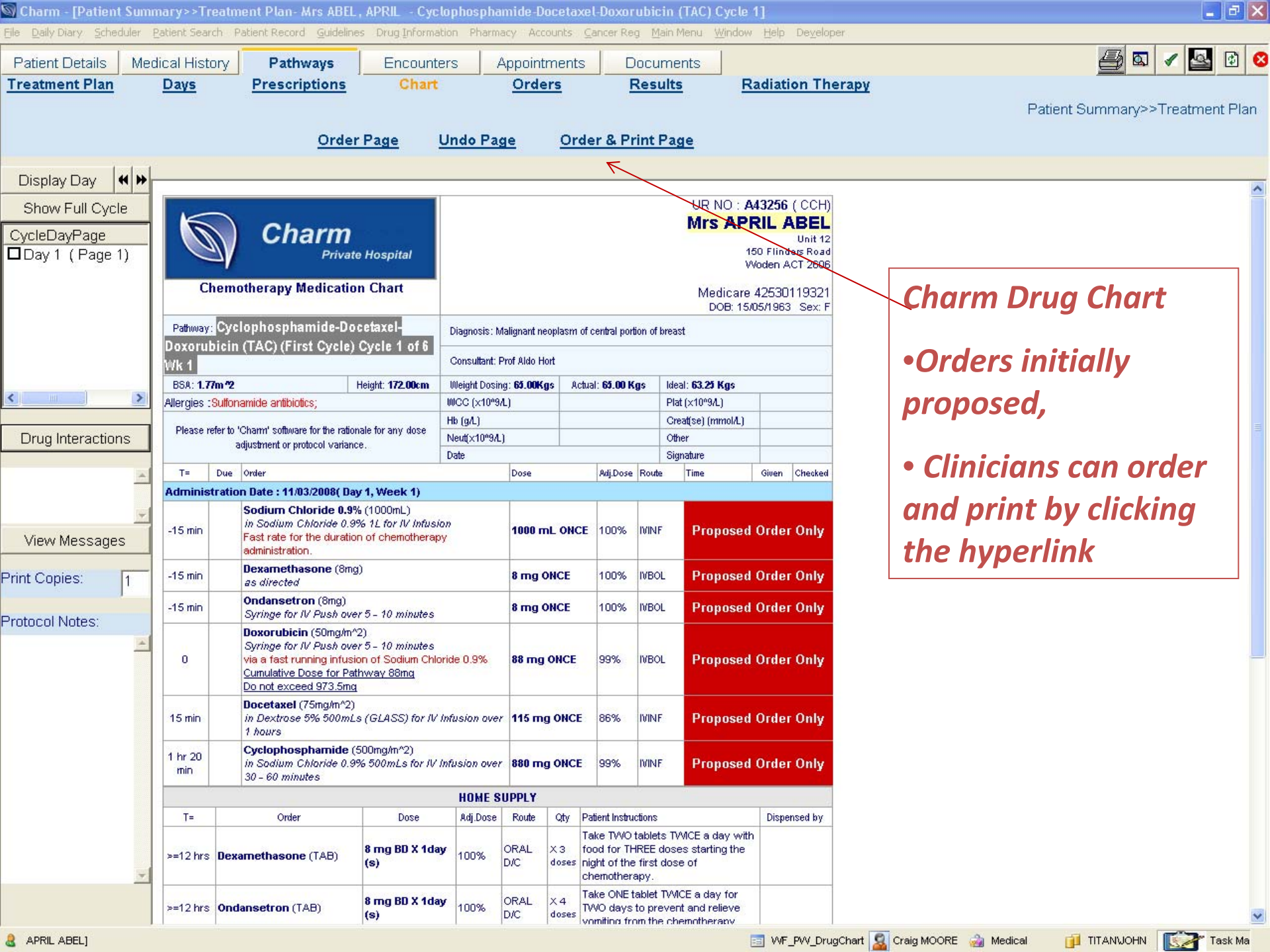

Charm - [Daily Diary]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Pathway Wizard - Step 6 of 7 - Adjust Dosing Rules- Mrs ABEL, APRIL
Pathway Wizard - Step 6 of 7 - Adjust Dosing Rules
Medication List
Edit Dose
Optional Administration
Protocol Dose Limits
Code Cyclophosphamide-Doceta Desc Docetaxel 75mg/m^2 IVINF D1;□□Doxorubicin 50mg/m^2 IVBOL D1; □□Cyclophosphamide 500mg/m TotalCycles 6
Delete
Substitute Selected Drug
Insert Drug
DrugName
Cycles 1 to 1
Sodium Chlori
Dexamethaso
Ondansetron
Doxorubicin
Docetaxel
Cyclophospha
Dexamethaso
Ondansetron
Dexamethaso
Metoclopramic
Cycles 2 to 5
Sodium Chlori
Ondansetron
Doxorubicin
Docetaxel
Cyclophospha
Ondansetron
Dexamethaso
Metoclopramic
Cycles 6 to 6
Sodium Chlori
Ondansetron
Doxorubicin
Docetaxel
Cycle Drug Selection
Cycle Drug Selection
Select Substitute Drug Order From List
Description
ContainerSize
Type
Statu
Ondansetron INJIV 8mg per dose ONCE IVINF (x 1 doses) Script Activ
Ondansetron TAB 4mg per dose BD ORAL (x 4 doses) Script Activ
Ondansetron TAB 4mg per dose ONCE ORAL (x 1 doses) Script Activ
Ondansetron TAB 8mg per dose BID ORAL (x 4 doses) Script Activ
Ondansetron TAB 8mg per dose ONCE ORAL (x 1 doses) Script Activ
Ondansetron WAFER 8mg per dose BD ORAL (x 4 doses) Script Activ
Prochlorperazine INJ 12.5mg per dose ONCE IVBOL (x 1 doses) Script Activ
Prochlorperazine INJ 12.5mg per dose TDS PRN IMUSC (x 3 doses) Script Activ
Prochlorperazine SUP 25mg per dose TDS PRN RECTAL (x 5 doses) Script Activ
Prochlorperazine SUP 5mg per dose TDS PRN RECTAL (x 5 doses) Script Activ
Prochlorperazine TAB 5-10mg per dose ONCE ORAL (x 1 doses) Script Activ
Prochlorperazine TAB 5-10mg per dose TDS ORAL (x 12 doses) Script Activ
Tropisetron CAP 5mg per dose Daily ORAL (x 2 doses) Script Activ
Tropisetron CAP 5mg per dose ONCE ORAL (x 1 doses) Script Activ
Tropisetron INJ 5mg per dose Daily IVBOL (x 1 doses) Script Activ
Apply changes to all instances in Pathway
Document Reason
Lactose intolerant (zofran contains lactose filler)
Substitute
Cancel
Undo Changes
Save Changes for Future Use
Cancel
Back
Next
Finish



Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au



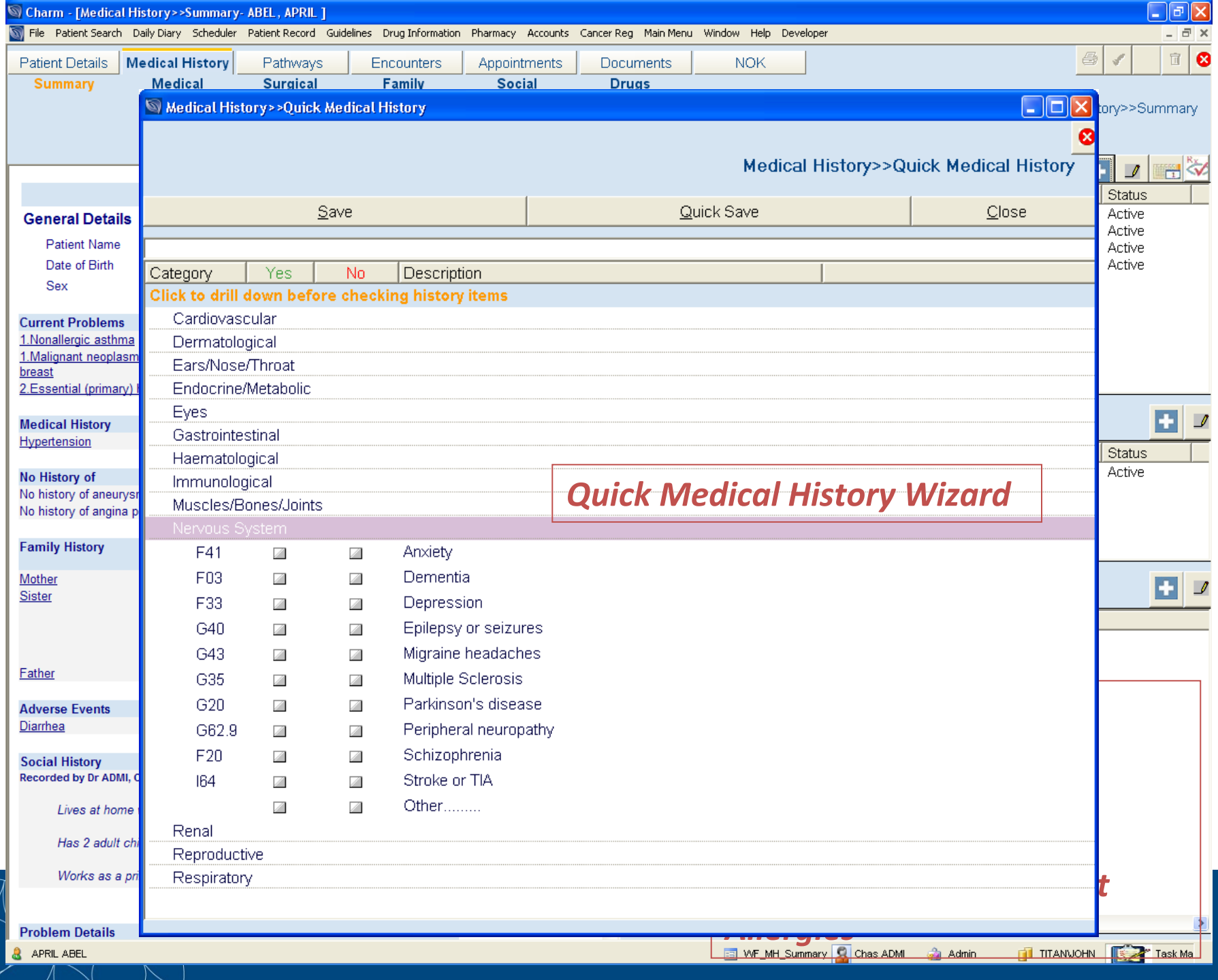
Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au


Charm - [Patient Summary>>Treatment Plan- Mrs ABEL, APRIL - Cyclophosphamide-Docetaxel-Doxorubicin (TAC) Cycle 1]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details Medical History Pathways Encounters Appointments Documents
Treatment Plan Days Prescriptions Chart Orders Results Radiation Therapy
Patient Summary>>Treatment Plan
Order Page Undo Page Order & Print Page
Display Day
Show Full Cycle
CycleDayPage
Day 1 (Page 1)
Drug Interactions
View Messages
Print Copies: 1
Protocol Notes:
Charm Private Hospital
Chemotherapy Medication Chart
UR NO : A43256 (CCH)
Mrs APRIL ABEL
Unit 12
150 Flinders Road
Woden ACT 2606
Medicare 42530119321
DOB: 15/05/1963 Sex: F
Pathway: Cyclophosphamide-Docetaxel-Doxorubicin (TAC) (First Cycle) Cycle 1 of 6 Wk 1
Diagnosis: Malignant neoplasm of central portion of breast
Consultant: Prof Aldo Hort
BSA: 1.77m^2 Height: 172.00cm
Weight Dosing: 65.00Kgs Actual: 65.00 Kgs Ideal: 63.25 Kgs
Allergies :Sulfonamide antibiotics;
WCC (x10^9/L) Plat (x10^9/L)
Please refer to 'Charm' software for the rationale for any dose adjustment or protocol variance.
Hb (g/L) Creat(se) (mmol/L)
Neut(x10^9/L) Other
Date Signature
T= Due Order Dose Adj.Dose Route Time Given Checked
Administration Date : 11/03/2008(Day 1, Week 1)
-15 min Sodium Chloride 0.9% (1000mL) in Sodium Chloride 0.9% 1L for IV Infusion Fast rate for the duration of chemotherapy administration. 1000 mL ONCE 100% IVINF Proposed Order Only
-15 min Dexamethasone (8mg) as directed 8 mg ONCE 100% IVBOL Proposed Order Only
-15 min Ondansetron (8mg) Syringe for IV Push over 5 - 10 minutes 8 mg ONCE 100% IVBOL Proposed Order Only
0 Doxorubicin (50mg/m^2) Syringe for IV Push over 5 - 10 minutes via a fast running infusion of Sodium Chloride 0.9% Cumulative Dose for Pathway 88mg Do not exceed 973.5mg 88 mg ONCE 99% IVBOL Proposed Order Only
15 min Docetaxel (75mg/m^2) in Dextrose 5% 500mLs (GLASS) for IV Infusion over 1 hours 115 mg ONCE 86% IVINF Proposed Order Only
1 hr 20 min Cyclophosphamide (500mg/m^2) in Sodium Chloride 0.9% 500mLs for IV Infusion over 30 - 60 minutes 880 mg ONCE 99% IVINF Proposed Order Only
HOME SUPPLY
T= Order Dose Adj.Dose Route Qty Patient Instructions Dispensed by
>=12 hrs Dexamethasone (TAB) 8 mg BD X 1day (s) 100% ORAL D/C X 3 doses Take TWO tablets TWICE a day with food for THREE doses starting the night of the first dose of chemotherapy.
>=12 hrs Ondansetron (TAB) 8 mg BD X 1day (s) 100% ORAL D/C X 4 doses Take ONE tablet TWICE a day for TWO days to prevent and relieve vomiting from the chemotherapy
Charm Drug Chart
•Orders initially proposed,
• Clinicians can order and print by clicking the hyperlink
APRIL ABEL]
WF_PW_DrugChart Craig MOORE Medical TITAN\JOHN Task Ma

Electronic Medical Record

Work flow –

- Review patient information (History – Medical, Surgical etc)
- Current condition
  - Current diagnoses
  - Current problems
  - Review of symptoms
  - Physical examination
  - Test results - Pathology/Radiology Orders &Results
- Determine (and document) treatment plan
- Encounters and encounter management (multidisciplinary)
- Medication Management/Allergies
  - Update medication lists, orders, prescribe
- Order tests
- Device Management
- Update treatment plan (PRN)
- Complete Episode of Care – transfer, discharge (or maintain)


Charm - [Medical History>>Summary- ABEL, APRIL]
File Patient Search Daily Diary Scheduler Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details
Medical History
Pathways
Encounters
Appointments
Documents
NOK
Summary
Medical
Surgical
Family
Social
Drugs
Medical History>>Quick Medical History
Medical History>>Quick Medical History
Save
Quick Save
Close
Category
Yes
No
Description
Click to drill down before checking history items
Cardiovascular
Dermatological
Ears/Nose/Throat
Endocrine/Metabolic
Eyes
Gastrointestinal
Haematological
Immunological
Muscles/Bones/Joints
Nervous System
F41 Anxiety
F03 Dementia
F33 Depression
G40 Epilepsy or seizures
G43 Migraine headaches
G35 Multiple Sclerosis
G20 Parkinson's disease
G62.9 Peripheral neuropathy
F20 Schizophrenia
I64 Stroke or TIA
Other.....
Renal
Reproductive
Respiratory
Quick Medical History Wizard
General Details
Patient Name
Date of Birth
Sex
Current Problems
1.Nonallergic asthma
Medical History
Hypertension
No History of
Family History
Mother
Sister
Father
Adverse Events
Diarrhea
Social History
Problem Details
Status
Active
APRIL ABEL
WF_MH_Summary
Chas ADMI
Admin
TITANJOHN

Medication History

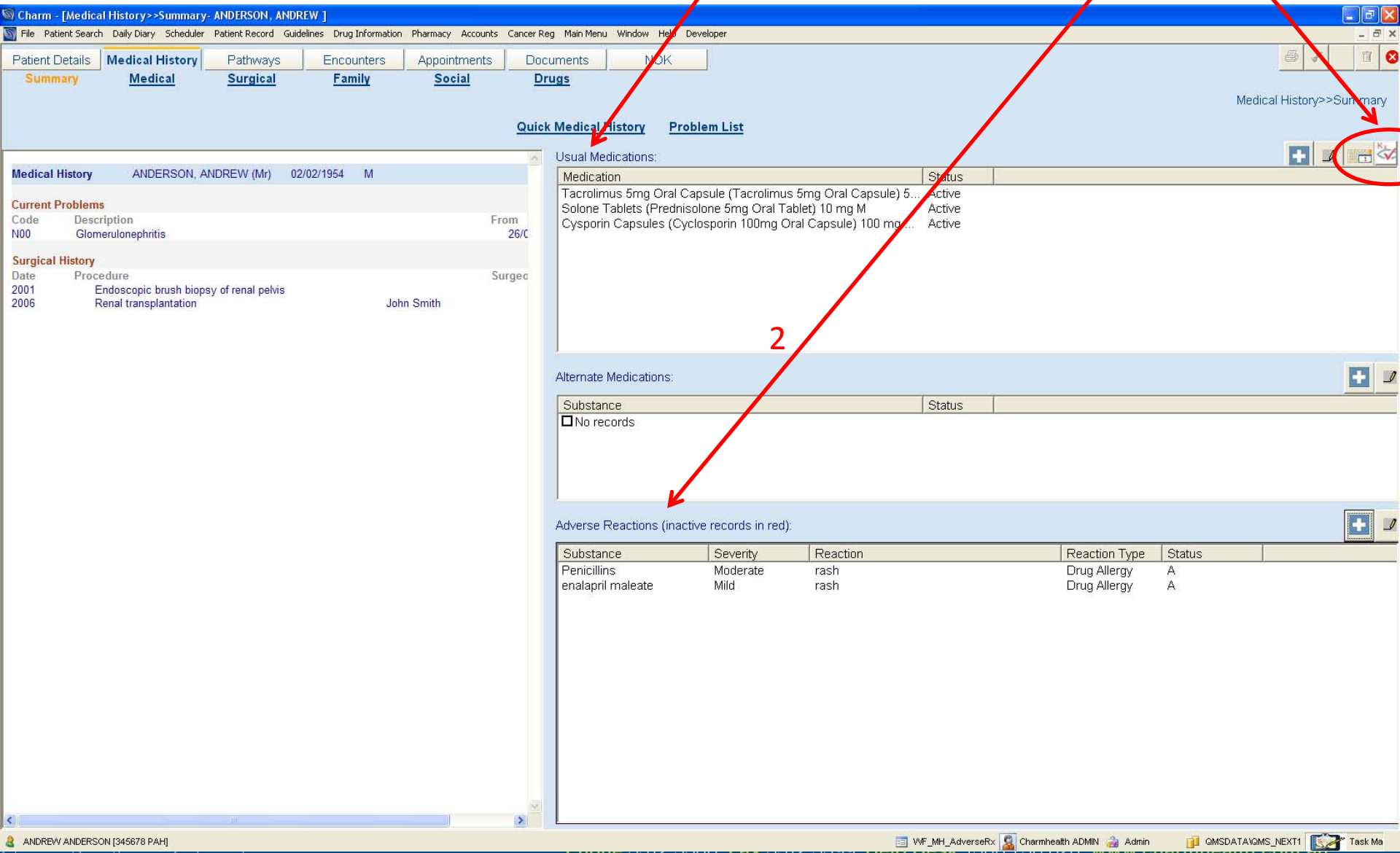
Pharmacist

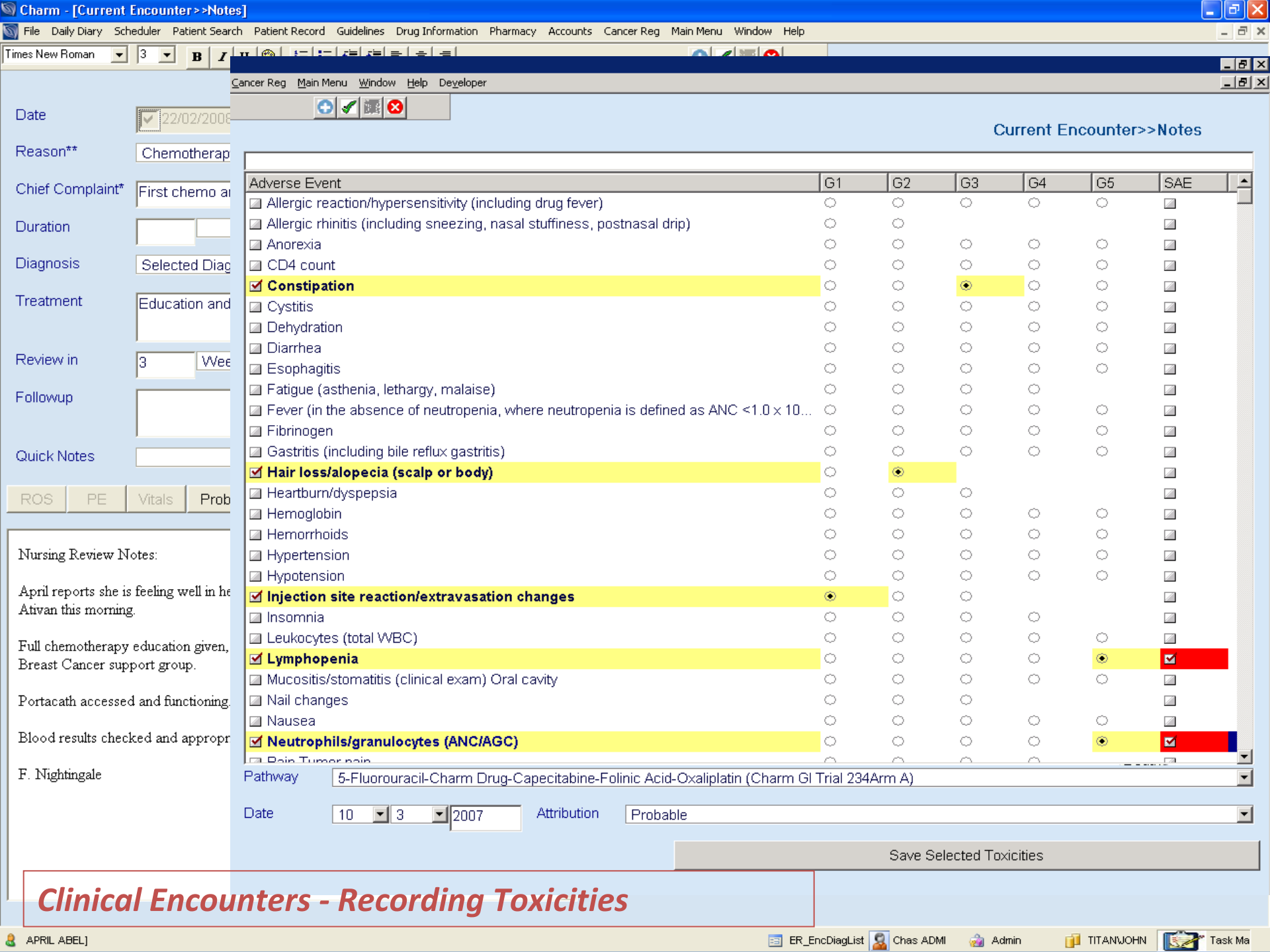
Prescriber

1

2

3



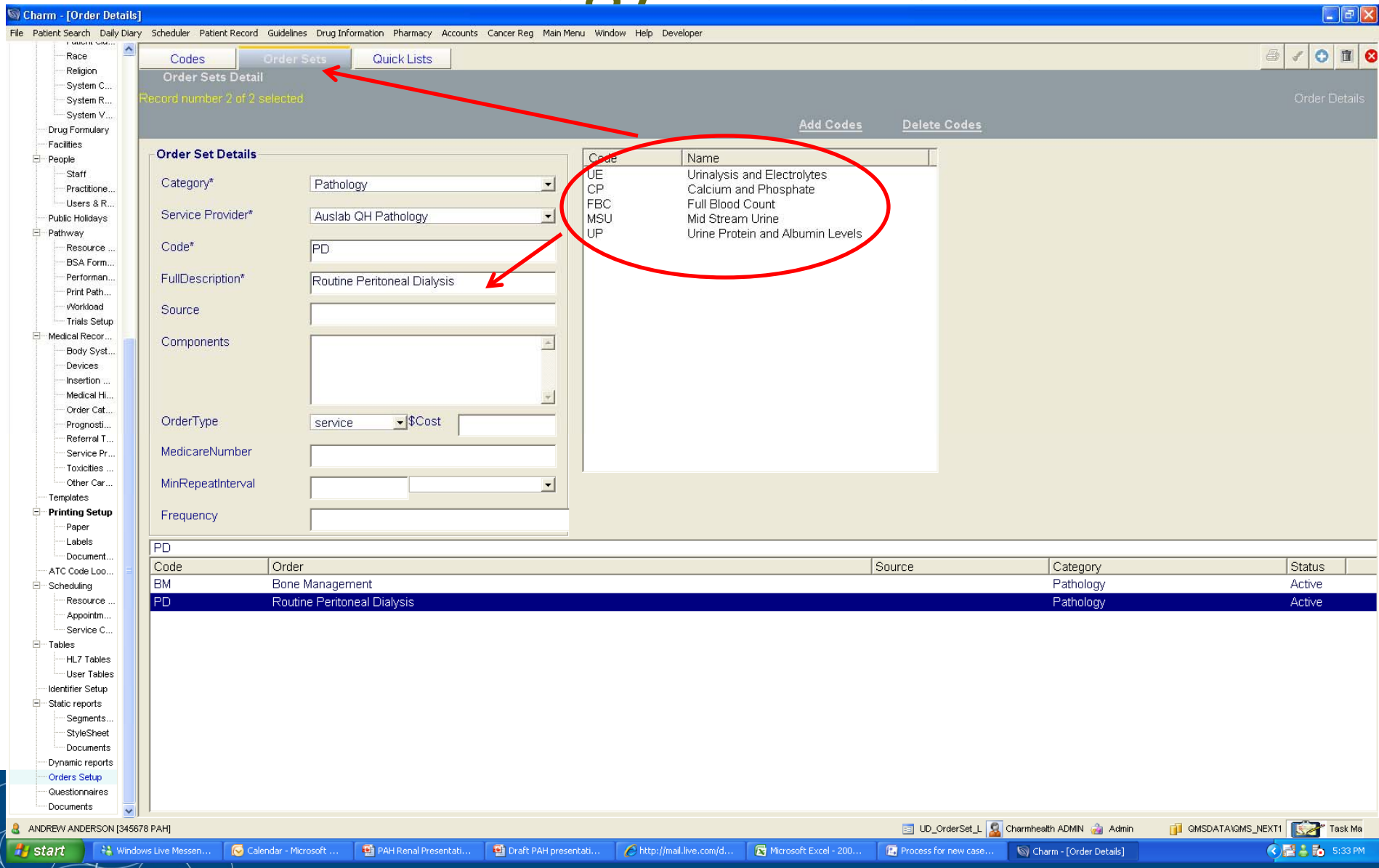

Charm - [Current Encounter>>Notes]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help
Cancer Reg Main Menu Window Help Developer
Current Encounter>>Notes
Date
Reason**
Chief Complaint*
Duration
Diagnosis
Treatment
Review in
Followup
Quick Notes
ROS PE Vitals Prob
Nursing Review Notes:
April reports she is feeling well in he
Ativan this morning.
Full chemotherapy education given,
Breast Cancer support group.
Portacath accessed and functioning.
Blood results checked and appropr
F. Nightingale
Adverse Event G1 G2 G3 G4 G5 SAE
Allergic reaction/hypersensitivity (including drug fever)
Allergic rhinitis (including sneezing, nasal stuffiness, postnasal drip)
Anorexia
CD4 count
Constipation
Cystitis
Dehydration
Diarrhea
Esophagitis
Fatigue (asthenia, lethargy, malaise)
Fever (in the absence of neutropenia, where neutropenia is defined as ANC <1.0 x 10...
Fibrinogen
Gastritis (including bile reflux gastritis)
Hair loss/alopecia (scalp or body)
Heartburn/dyspepsia
Hemoglobin
Hemorrhoids
Hypertension
Hypotension
Injection site reaction/extravasation changes
Insomnia
Leukocytes (total WBC)
Lymphopenia
Mucositis/stomatitis (clinical exam) Oral cavity
Nail changes
Nausea
Neutrophils/granulocytes (ANC/AGC)
Pathway
5-Fluorouracil-Charm Drug-Capecitabine-Folinic Acid-Oxaliplatin (Charm GI Trial 234Arm A)
Date
10
3
2007
Attribution
Probable
Save Selected Toxicities
Clinical Encounters - Recording Toxicities
APRIL ABEL]
ER_EncDiagList
Chas ADMI
Admin
TITANJOHN
Task Ma

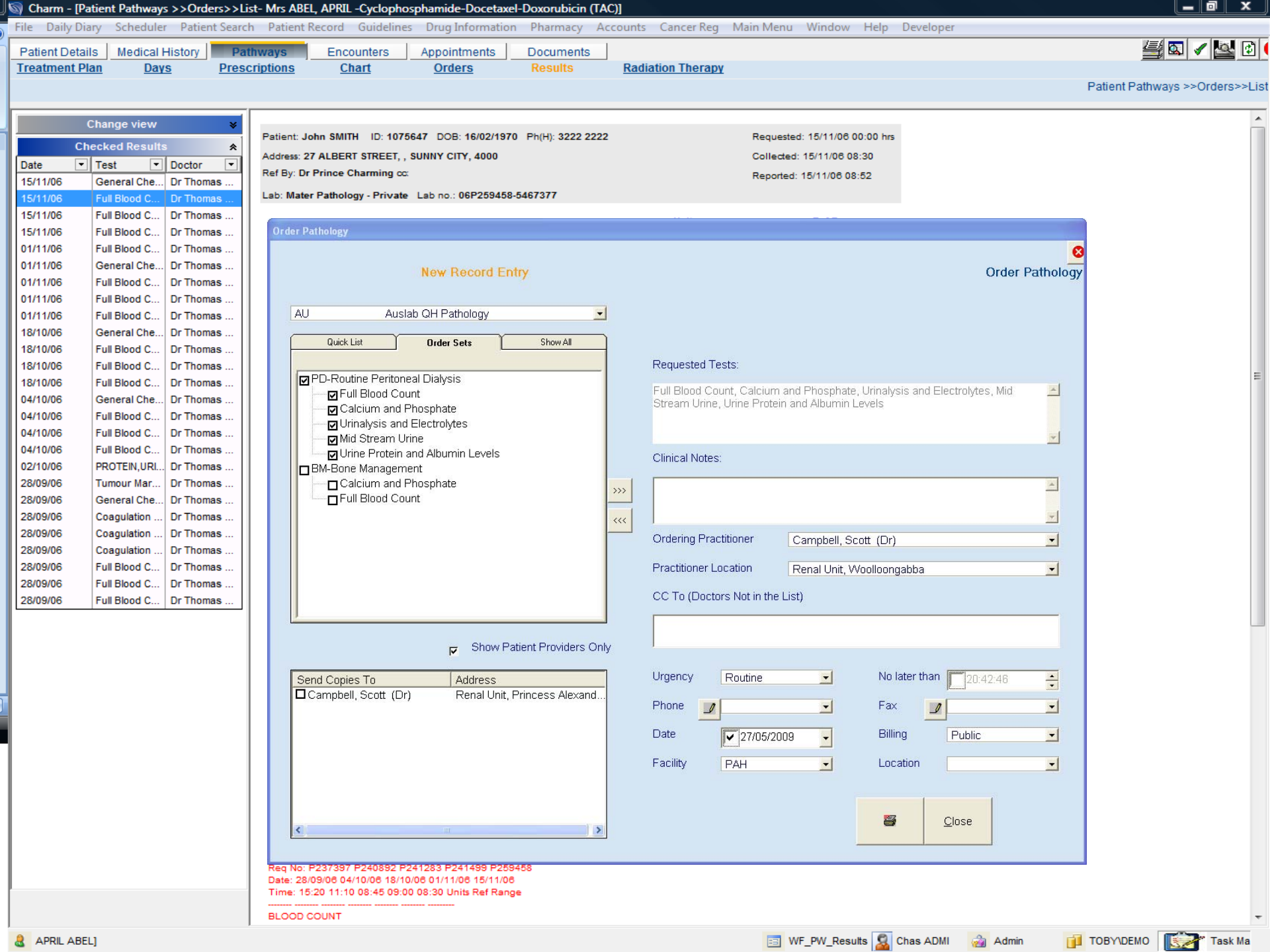
EMR Findings

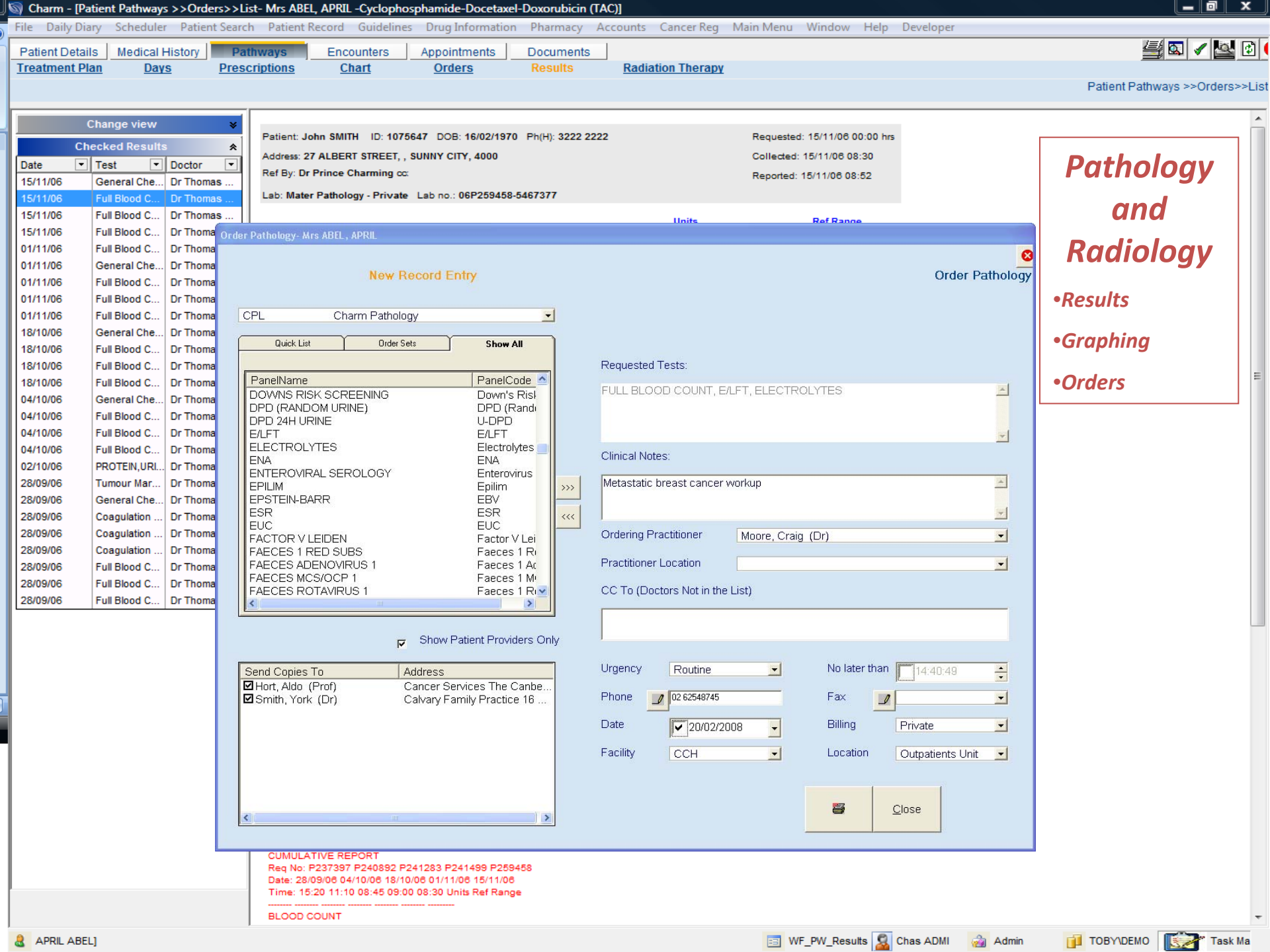
- Sites gained confidence and increased usage of EMR functionality the longer they had used the product
- Information on diagnosis was recorded for 39.6% of patients (N=19,351)
- Two facilities, contributed over 90% of completion rates for these data
  - strong clinical champions
  - over four year's experience
- Co-morbid medical conditions were only recorded for 2.9% of patients

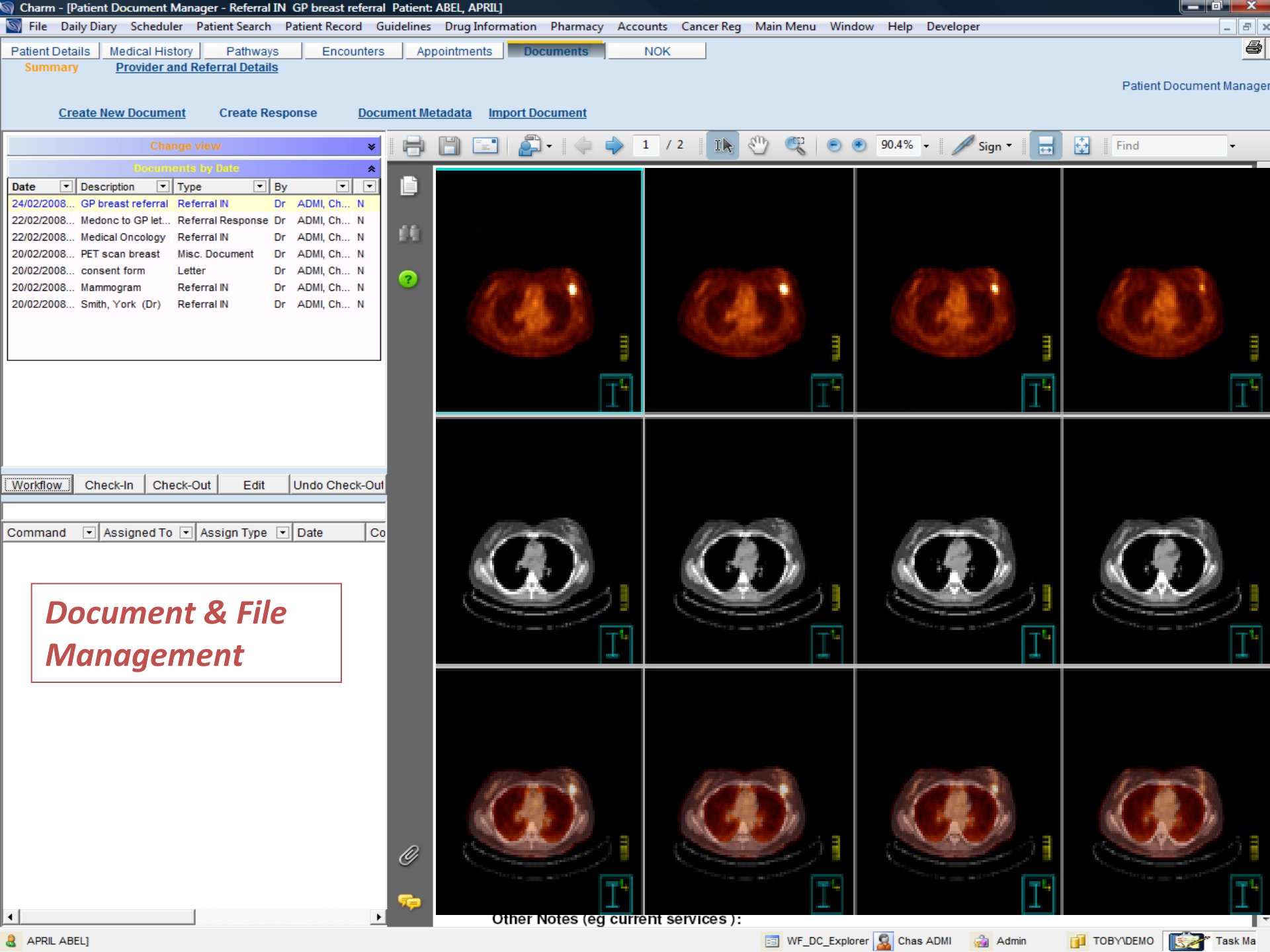
charmhealth
more than connectivity

Pathology Order Sets



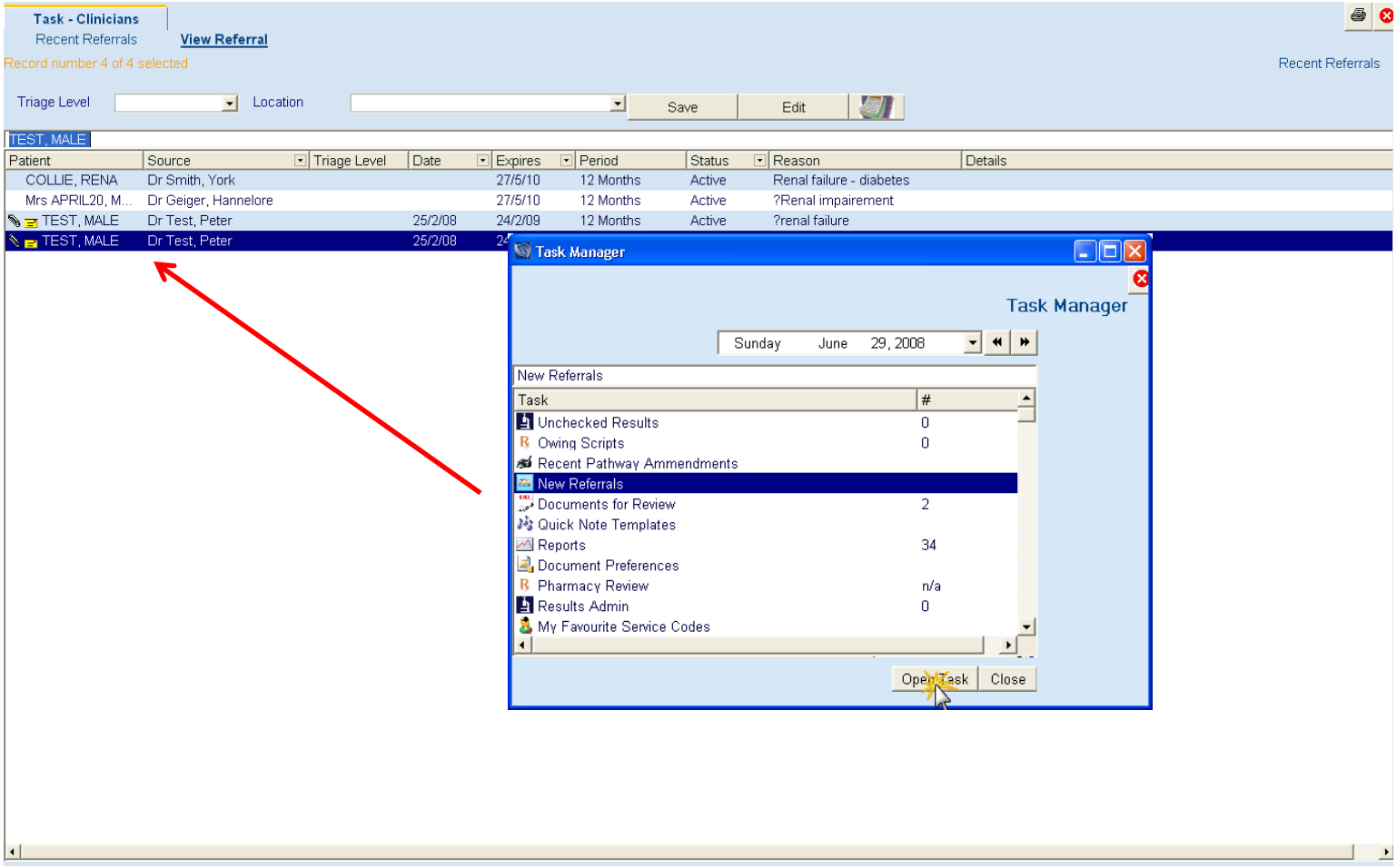

Charm - [Patient Pathways >>Orders>>List- Mrs ABEL, APRIL -Cyclophosphamide-Docetaxel-Doxorubicin (TAC)]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details Medical History Pathways Encounters Appointments Documents
Treatment Plan Days Prescriptions Chart Orders Results Radiation Therapy
Patient Pathways >>Orders>>List
Change view
Checked Results
Date Test Doctor
15/11/06 General Che... Dr Thomas ...
15/11/06 Full Blood C... Dr Thomas ...
15/11/06 Full Blood C... Dr Thomas ...
15/11/06 Full Blood C... Dr Thomas ...
01/11/06 Full Blood C... Dr Thomas ...
01/11/06 General Che... Dr Thomas ...
01/11/06 Full Blood C... Dr Thomas ...
01/11/06 Full Blood C... Dr Thomas ...
01/11/06 Full Blood C... Dr Thomas ...
01/11/06 Full Blood C... Dr Thomas ...
18/10/06 General Che... Dr Thomas ...
18/10/06 Full Blood C... Dr Thomas ...
18/10/06 Full Blood C... Dr Thomas ...
18/10/06 Full Blood C... Dr Thomas ...
04/10/06 General Che... Dr Thomas ...
04/10/06 Full Blood C... Dr Thomas ...
04/10/06 Full Blood C... Dr Thomas ...
04/10/06 Full Blood C... Dr Thomas ...
02/10/06 PROTEIN,URI... Dr Thomas ...
28/09/06 Tumour Mar... Dr Thomas ...
28/09/06 General Che... Dr Thomas ...
28/09/06 Coagulation ... Dr Thomas ...
28/09/06 Coagulation ... Dr Thomas ...
28/09/06 Coagulation ... Dr Thomas ...
28/09/06 Full Blood C... Dr Thomas ...
28/09/06 Full Blood C... Dr Thomas ...
28/09/06 Full Blood C... Dr Thomas ...
Patient: John SMITH ID: 1075647 DOB: 16/02/1970 Ph(H): 3222 2222
Address: 27 ALBERT STREET, , SUNNY CITY, 4000
Ref By: Dr Prince Charming cc:
Lab: Mater Pathology - Private Lab no.: 06P259458-5467377
Requested: 15/11/06 00:00 hrs
Collected: 15/11/06 08:30
Reported: 15/11/06 08:52
Order Pathology
New Record Entry
Order Pathology
AU Auslab QH Pathology
Quick List
Order Sets
Show All
PD-Routine Peritoneal Dialysis
Full Blood Count
Calcium and Phosphate
Urinalysis and Electrolytes
Mid Stream Urine
Urine Protein and Albumin Levels
BM-Bone Management
Calcium and Phosphate
Full Blood Count
>>>
<<<
Requested Tests:
Full Blood Count, Calcium and Phosphate, Urinalysis and Electrolytes, Mid Stream Urine, Urine Protein and Albumin Levels
Clinical Notes:
Ordering Practitioner Campbell, Scott (Dr)
Practitioner Location Renal Unit, Woolloongabba
CC To (Doctors Not in the List)
Show Patient Providers Only
Send Copies To Address
Campbell, Scott (Dr) Renal Unit, Princess Alexand...
Urgency Routine
No later than 20:42:46
Phone
Fax
Date 27/05/2009
Billing Public
Facility PAH
Location
Close
Req No: P237397 P240892 P241283 P241499 P259458
Date: 28/09/06 04/10/06 18/10/06 01/11/06 15/11/06
Time: 15:20 11:10 08:45 09:00 08:30 Units Ref Range
BLOOD COUNT
APRIL ABEL]
WF_PW_Results
Chas ADMI
Admin
TOBY\DEMO
Task Ma


Charm - [Patient Pathways >>Orders>>List- Mrs ABEL, APRIL -Cyclophosphamide-Docetaxel-Doxorubicin (TAC)]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details Medical History Pathways Encounters Appointments Documents
Treatment Plan Days Prescriptions Chart Orders Results Radiation Therapy
Patient Pathways >>Orders>>List
Change view
Checked Results
Date Test Doctor
15/11/06 General Che... Dr Thomas ...
15/11/06 Full Blood C... Dr Thomas ...
15/11/06 Full Blood C... Dr Thomas ...
15/11/06 Full Blood C... Dr Thoma
01/11/06 Full Blood C... Dr Thoma
01/11/06 General Che... Dr Thoma
01/11/06 Full Blood C... Dr Thoma
01/11/06 Full Blood C... Dr Thoma
01/11/06 Full Blood C... Dr Thoma
18/10/06 General Che... Dr Thoma
18/10/06 Full Blood C... Dr Thoma
18/10/06 Full Blood C... Dr Thoma
18/10/06 Full Blood C... Dr Thoma
04/10/06 General Che... Dr Thoma
04/10/06 Full Blood C... Dr Thoma
04/10/06 Full Blood C... Dr Thoma
04/10/06 Full Blood C... Dr Thoma
02/10/06 PROTEIN,URI... Dr Thoma
28/09/06 Tumour Mar... Dr Thoma
28/09/06 General Che... Dr Thoma
28/09/06 Coagulation ... Dr Thoma
28/09/06 Coagulation ... Dr Thoma
28/09/06 Coagulation ... Dr Thoma
28/09/06 Full Blood C... Dr Thoma
28/09/06 Full Blood C... Dr Thoma
28/09/06 Full Blood C... Dr Thoma
Patient: John SMITH ID: 1075647 DOB: 16/02/1970 Ph(H): 3222 2222
Address: 27 ALBERT STREET, , SUNNY CITY, 4000
Ref By: Dr Prince Charming cc:
Lab: Mater Pathology - Private Lab no.: 06P259458-5467377
Requested: 15/11/06 00:00 hrs
Collected: 15/11/06 08:30
Reported: 15/11/06 08:52
Units Ref Range
Order Pathology- Mrs ABEL, APRIL
New Record Entry
Order Pathology
CPL Charm Pathology
Quick List Order Sets Show All
PanelName PanelCode
DOWNS RISK SCREENING Down's Risk
DPD (RANDOM URINE) DPD (Rand
DPD 24H URINE U-DPD
E/LFT E/LFT
ELECTROLYTES Electrolytes
ENA ENA
ENTEROVIRAL SEROLOGY Enterovirus
EPILIM Epilim
EPSTEIN-BARR EBV
ESR ESR
EUC EUC
FACTOR V LEIDEN Factor V Lei
FAECES 1 RED SUBS Faeces 1 R
FAECES ADENOVIRUS 1 Faeces 1 Ad
FAECES MCS/OCP 1 Faeces 1 M
FAECES ROTAVIRUS 1 Faeces 1 R
>>>
<<<
Show Patient Providers Only
Send Copies To Address
Hort, Aldo (Prof) Cancer Services The Canbe...
Smith, York (Dr) Calvary Family Practice 16 ...
Requested Tests:
FULL BLOOD COUNT, E/LFT, ELECTROLYTES
Clinical Notes:
Metastatic breast cancer workup
Ordering Practitioner Moore, Craig (Dr)
Practitioner Location
CC To (Doctors Not in the List)
Urgency Routine
No later than 14:40:49
Phone 02 62548745
Fax
Date 20/02/2008
Billing Private
Facility CCH
Location Outpatients Unit
Close
CUMULATIVE REPORT
Req No: P237397 P240892 P241283 P241499 P259458
Date: 28/09/06 04/10/06 18/10/06 01/11/06 15/11/06
Time: 15:20 11:10 08:45 09:00 08:30 Units Ref Range
BLOOD COUNT
Pathology and Radiology
•Results
•Graphing
•Orders
APRIL ABEL]
WF_PW_Results Chas ADMI Admin TOBY\DEMO Task Ma

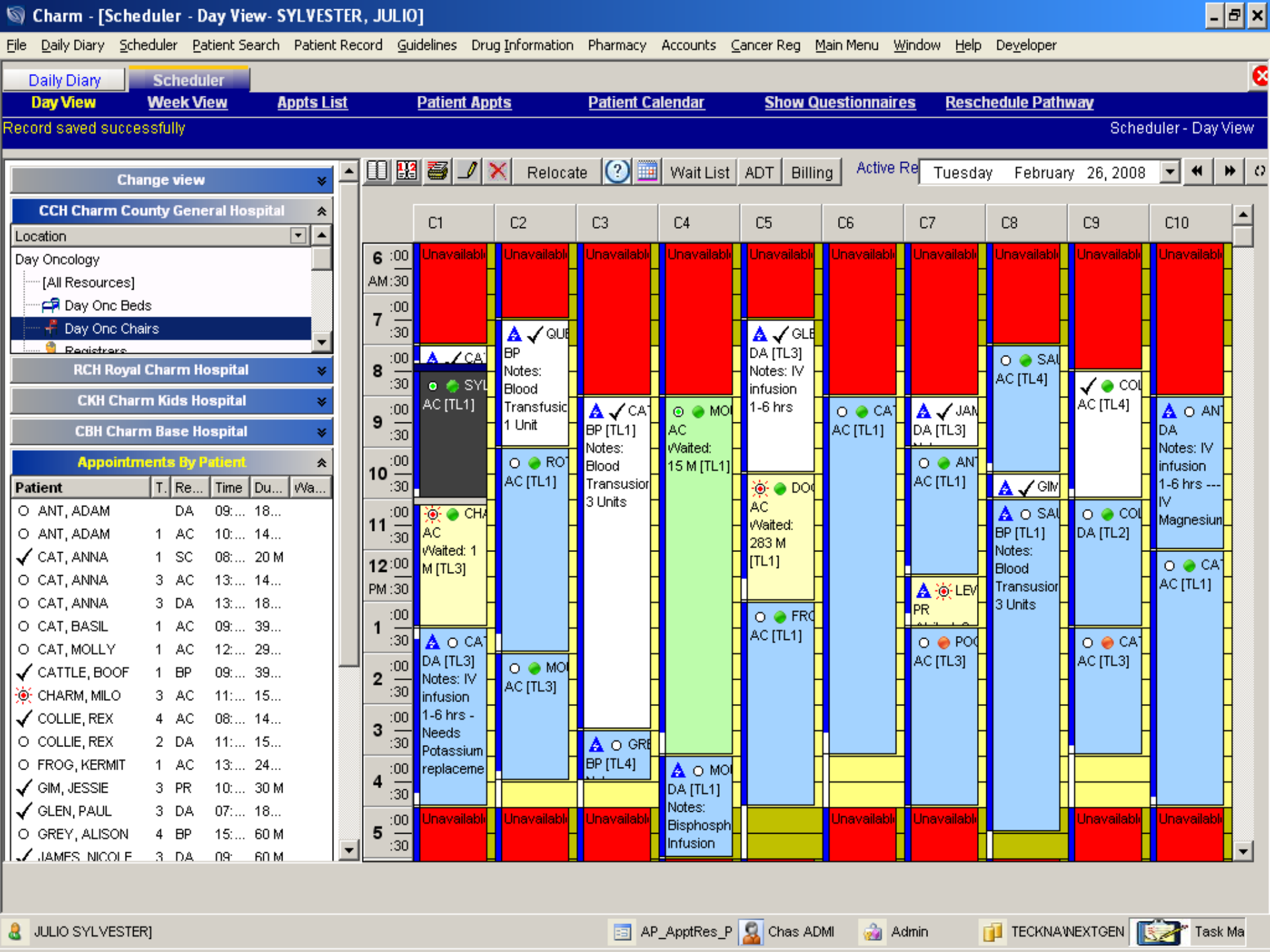

Charm - [Patient Document Manager - Referral IN GP breast referral Patient: ABEL, APRIL]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Patient Details Medical History Pathways Encounters Appointments Documents NOK
Summary Provider and Referral Details
Patient Document Manager
Create New Document Create Response Document Metadata Import Document
Change view
Documents by Date
Date Description Type By
24/02/2008... GP breast referral Referral IN Dr ADMI, Ch... N
22/02/2008... Medonc to GP let... Referral Response Dr ADMI, Ch... N
22/02/2008... Medical Oncology Referral IN Dr ADMI, Ch... N
20/02/2008... PET scan breast Misc. Document Dr ADMI, Ch... N
20/02/2008... consent form Letter Dr ADMI, Ch... N
20/02/2008... Mammogram Referral IN Dr ADMI, Ch... N
20/02/2008... Smith, York (Dr) Referral IN Dr ADMI, Ch... N
Workflow Check-In Check-Out Edit Undo Check-Out
Command Assigned To Assign Type Date Co
Document & File Management
1 / 2
90.4%
Sign
Find
Other Notes (eg current services):
APRIL ABEL]
WF_DC_Explorer Chas ADMI Admin TOBY\DEMO Task Ma

charmhealth
more than connectivity

Review and Triage Referral

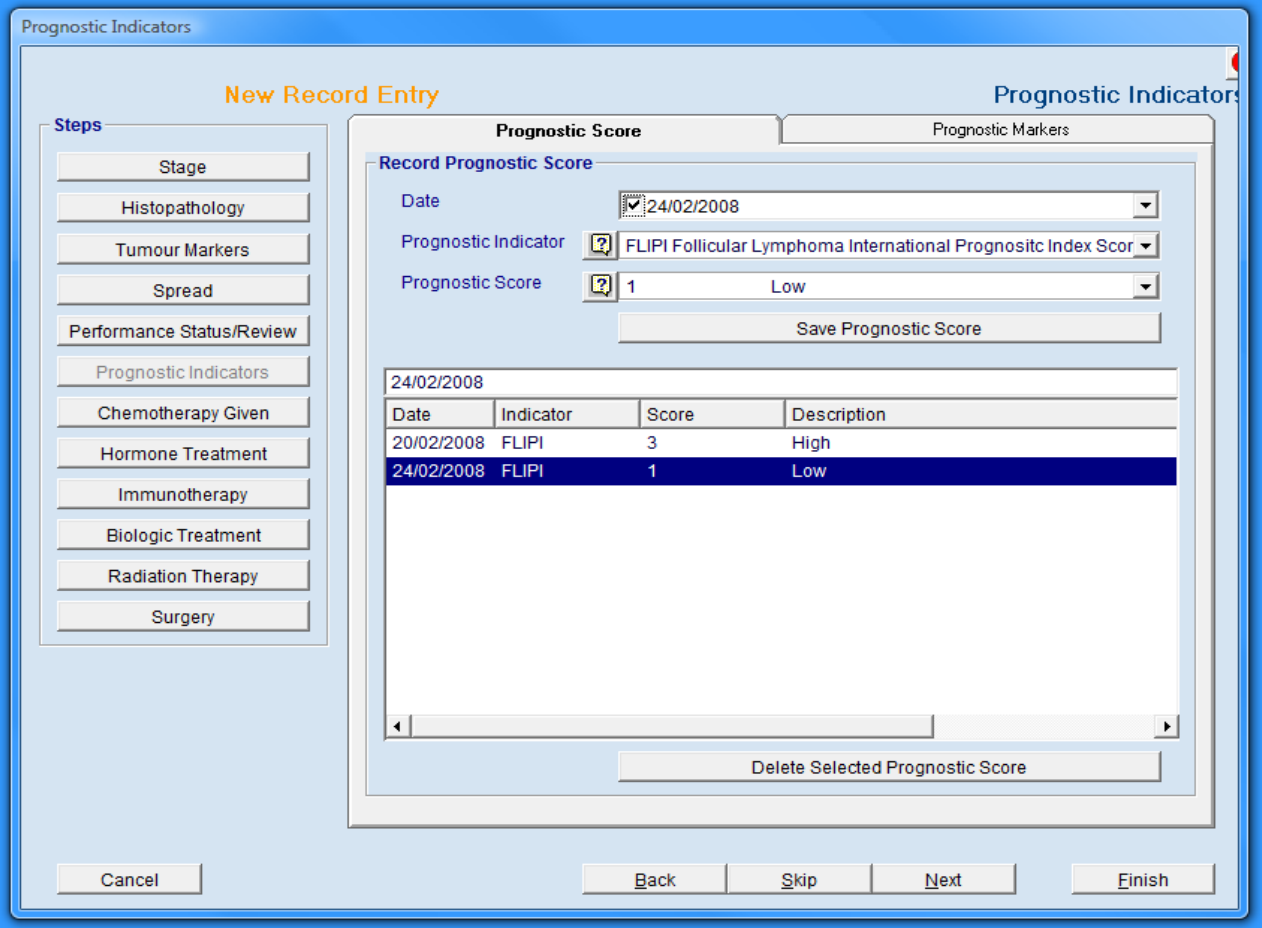


Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

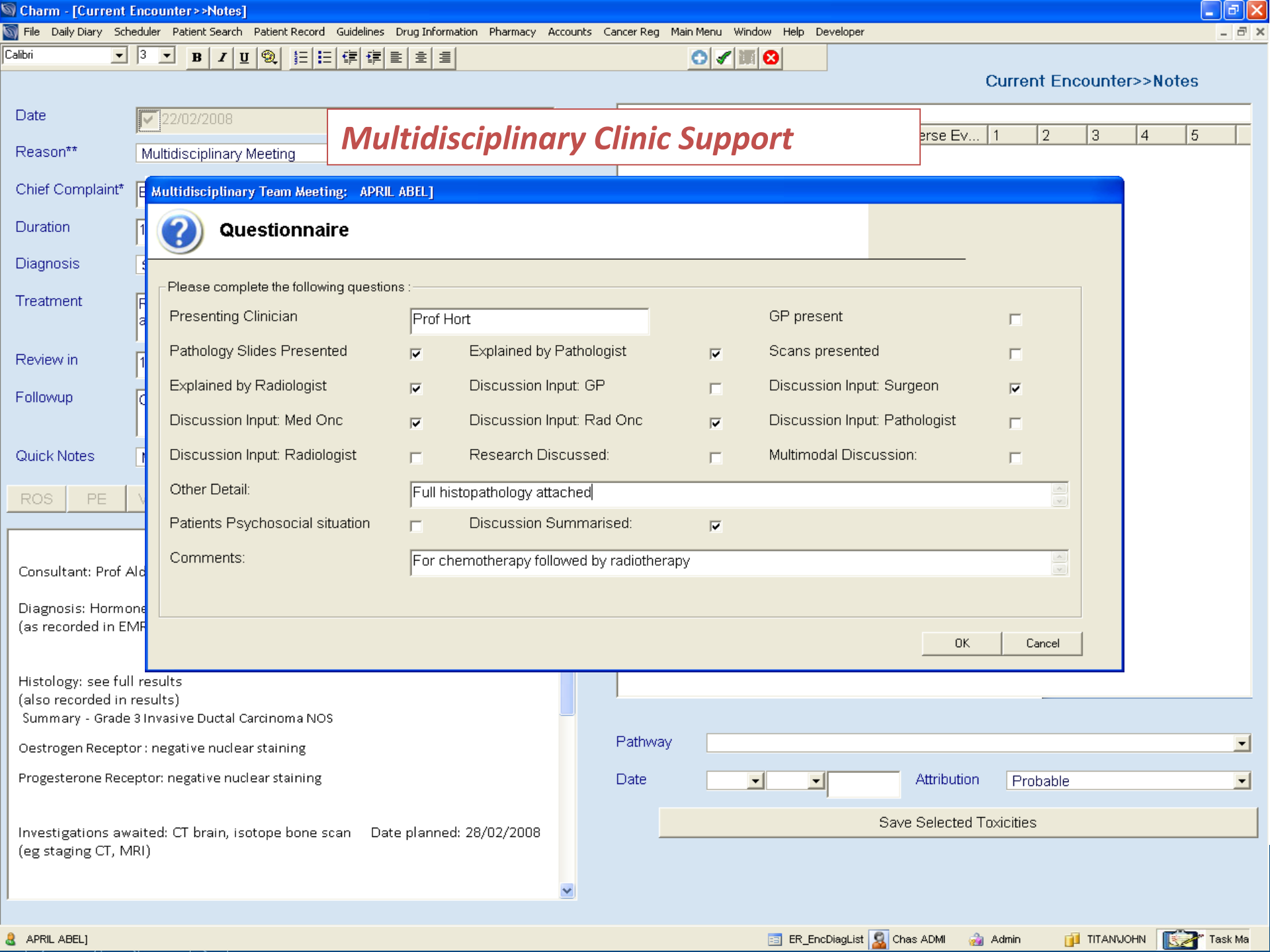

Charm - [Scheduler - Day View- SYLVESTER, JULIO]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Daily Diary
Scheduler
Day View
Week View
Appts List
Patient Appts
Patient Calendar
Show Questionnaires
Reschedule Pathway
Record saved successfully
Scheduler - Day View
Change view
CCH Charm County General Hospital
Location
Day Oncology
[All Resources]
Day Onc Beds
Day Onc Chairs
Registrars
RCH Royal Charm Hospital
CKH Charm Kids Hospital
CBH Charm Base Hospital
Appointments By Patient
Patient T. Re... Time Du... Wa...
ANT, ADAM DA 09:... 18...
ANT, ADAM 1 AC 10:... 14...
CAT, ANNA 1 SC 08:... 20 M
CAT, ANNA 3 AC 13:... 14...
CAT, ANNA 3 DA 13:... 18...
CAT, BASIL 1 AC 09:... 39...
CAT, MOLLY 1 AC 12:... 29...
CATTLE, BOOF 1 BP 09:... 39...
CHARM, MILO 3 AC 11:... 15...
COLLIE, REX 4 AC 08:... 14...
COLLIE, REX 2 DA 11:... 15...
FROG, KERMIT 1 AC 13:... 24...
GIM, JESSIE 3 PR 10:... 30 M
GLEN, PAUL 3 DA 07:... 18...
GREY, ALISON 4 BP 15:... 60 M
JAMES, NICOLE 3 DA 09:... 60 M
Relocate
Wait List
ADT
Billing
Active Re
Tuesday February 26, 2008
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10
6 AM 7 8 9 10 11 12 PM 1 2 3 4 5
Unavailable
AC [TL1]
BP Notes: Blood Transfusic 1 Unit
BP [TL1] Notes: Blood Transusior 3 Units
AC Waited: 15 M [TL1]
DA [TL3] Notes: IV infusion 1-6 hrs
AC Waited: 283 M [TL1]
AC [TL4]
DA [TL3]
AC [TL3]
BP [TL1] Notes: Blood Transusior 3 Units
DA [TL2]
DA Notes: IV infusion 1-6 hrs --- IV Magnesiun
DA [TL1] Notes: Bisphosph Infusion
DA [TL3] Notes: IV infusion 1-6 hrs - Needs Potassium replaceme
BP [TL4]
JULIO SYLVESTER]
AP_ApptRes_P
Chas ADMI
Admin
TECKNA\NEXTGEN
Task Ma

Information, Knowledge and Intelligence

- Data collection
  - Customisable Questionnaires
  - Disease Staging
  - Performance Status
  - Registry Interfaces
  - ANZdata
  - Research
  - Clinical Trials
- Interfaces with
  - PAS/Scheduling Systems/Finance
  - Pharmacy/Radiotherapy
  - Pathology/Radiology
- Data reporting
  - Dynamic Content Collection/Reporting
  - Custom Report Generation Tool
  - Customised data extraction routines
- Knowledge management and development
  - Clinical Practice Guidelines
  - Treatment Summaries / Pathways
  - Treatment Algorithms
  - Decision Support
    - Drug: Drug/Disease/Allergy
- "Intelligent" clinical services



Comprehensive cancer data collection:
-Cancer Registry Notification
-Research / organisation reporting

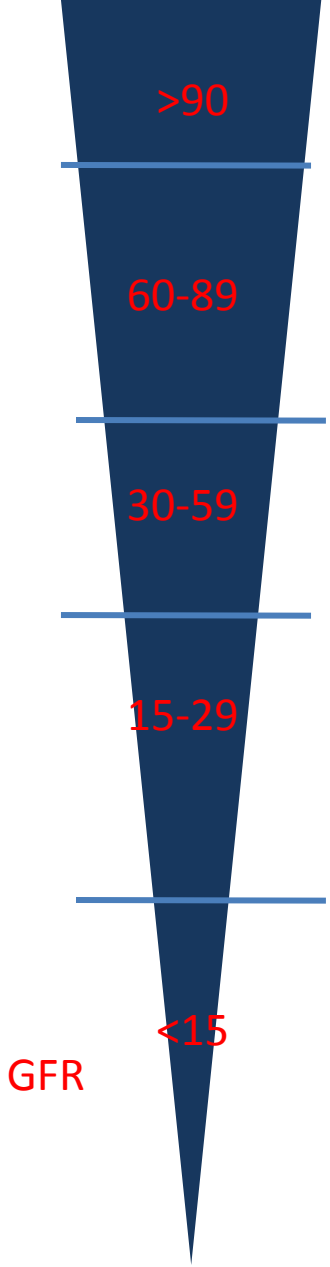

Charm - [Current Encounter>>Notes]
File Daily Diary Scheduler Patient Search Patient Record Guidelines Drug Information Pharmacy Accounts Cancer Reg Main Menu Window Help Developer
Current Encounter>>Notes
Multidisciplinary Clinic Support
Date
22/02/2008
Reason**
Multidisciplinary Meeting
Chief Complaint*
Duration
Diagnosis
Treatment
Review in
Followup
Quick Notes
ROS
PE
Multidisciplinary Team Meeting: APRIL ABEL]
Questionnaire
Please complete the following questions :
Presenting Clinician
Prof Hort
GP present
Pathology Slides Presented
Explained by Pathologist
Scans presented
Explained by Radiologist
Discussion Input: GP
Discussion Input: Surgeon
Discussion Input: Med Onc
Discussion Input: Rad Onc
Discussion Input: Pathologist
Discussion Input: Radiologist
Research Discussed:
Multimodal Discussion:
Other Detail:
Full histopathology attached
Patients Psychosocial situation
Discussion Summarised:
Comments:
For chemotherapy followed by radiotherapy
OK
Cancel
Consultant: Prof Alc
Diagnosis: Hormone
(as recorded in EMR
Histology: see full results
(also recorded in results)
Summary - Grade 3 Invasive Ductal Carcinoma NOS
Oestrogen Receptor : negative nuclear staining
Progesterone Receptor: negative nuclear staining
Investigations awaited: CT brain, isotope bone scan
(eg staging CT, MRI)
Date planned: 28/02/2008
Pathway
Date
Attribution
Probable
Save Selected Toxicities
APRIL ABEL]
ER_EncDiagList
Chas ADMI
Admin
TITANJOHN
Task Ma

charmhealth
more than connectivity

Implementing Findings

- Oncology migration
- Renal
- Medication management
- Chronic disease management
- Charm.Next

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au



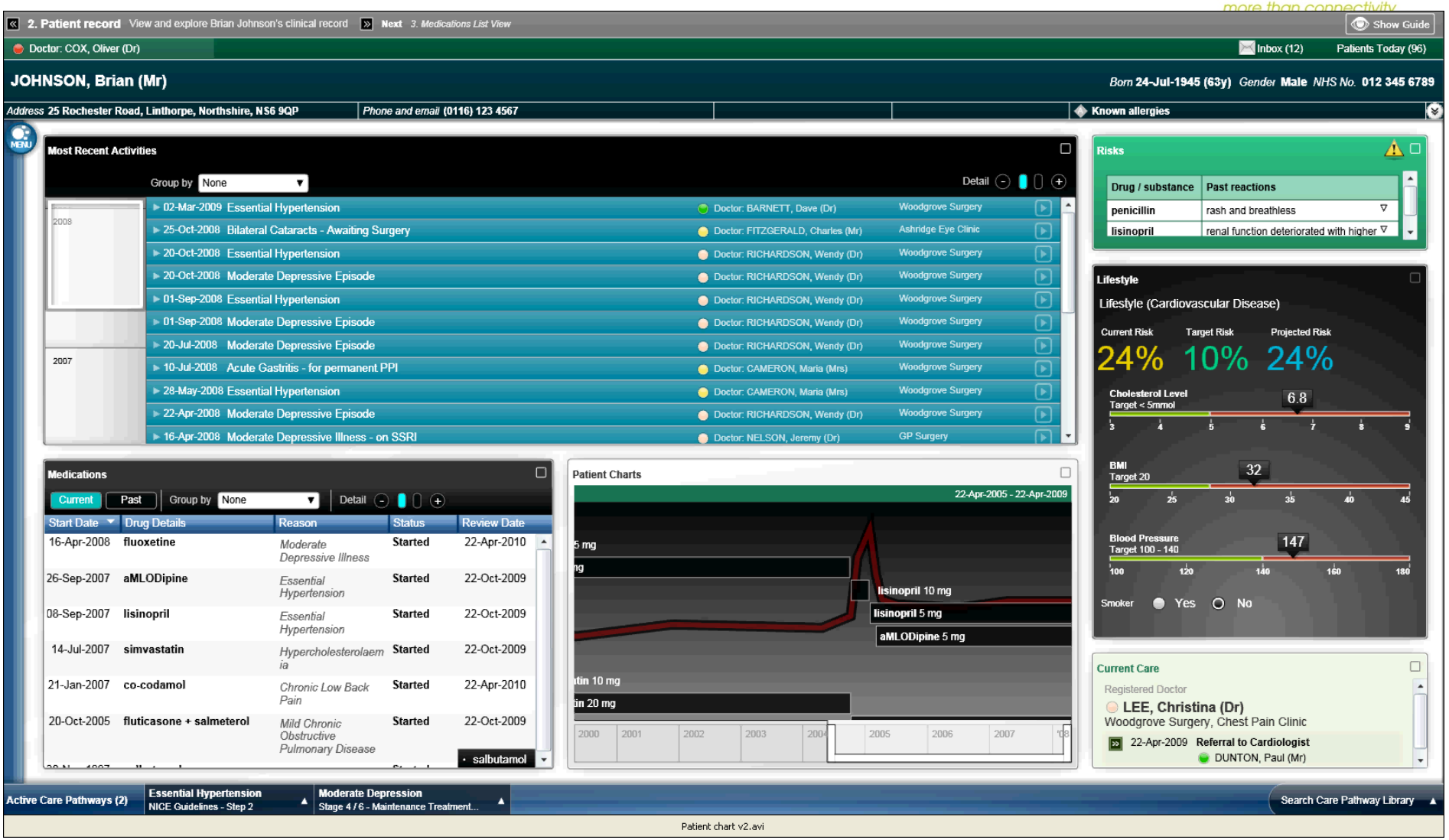
Charm Renal

charmhealth
more than connectivity

- Referral Management
  - Import referrals
  - Triage
  - Waitlist
- EMR – Documenting and managing renal disease
  - Patient History
  - **Medication Management**
  - Order Entry and Results
    - Anaemia, proteinuria and albuminuria
    - Serum Creatinine
    - Calcium, phosphate and PTH
  - Access Device Management
- GFR, BSA, IBW calculation and monitoring
- Planning for end-stage disease
  - Scheduling/Prescriptions
    - Dialysis – peritoneal/haemodialysis
    - Transplant
- Treatment Algorithms
- Data collection (ANZData)

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

charmhealth
more than connectivity



Patient chart v2.avi

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au

Conclusions

Key Findings

- Users favoured functionality for which they achieve greatest workflow efficiencies
- Success factors
  - Sites with a dedicated resource (such as a Charm Project Officer)
  - Longest exposure to the software used more of the functionality
  - Experience is a factor in the adoption of new work practices
- Patient safety and business benefits
  - Sites using more extensive functionality in disease and medication management
- Analysis of requirements
  - Management of oncology requires functionality in excess of that required for most other disease management,
  - Requirements for electronic medication management, electronic medical records and chronic disease management are
    - easily met within existing functionality
- Many sites are now requesting and undertaking broader application of existing functionality

charmhealth
more than connectivity

Thank you

Suite 13, 65 Macgregor Tce, Bardon Qld 4065
Phone 3512 5300 Fax 3512 5399 Help Desk 1300 736 620 www.charmhealth.com.au