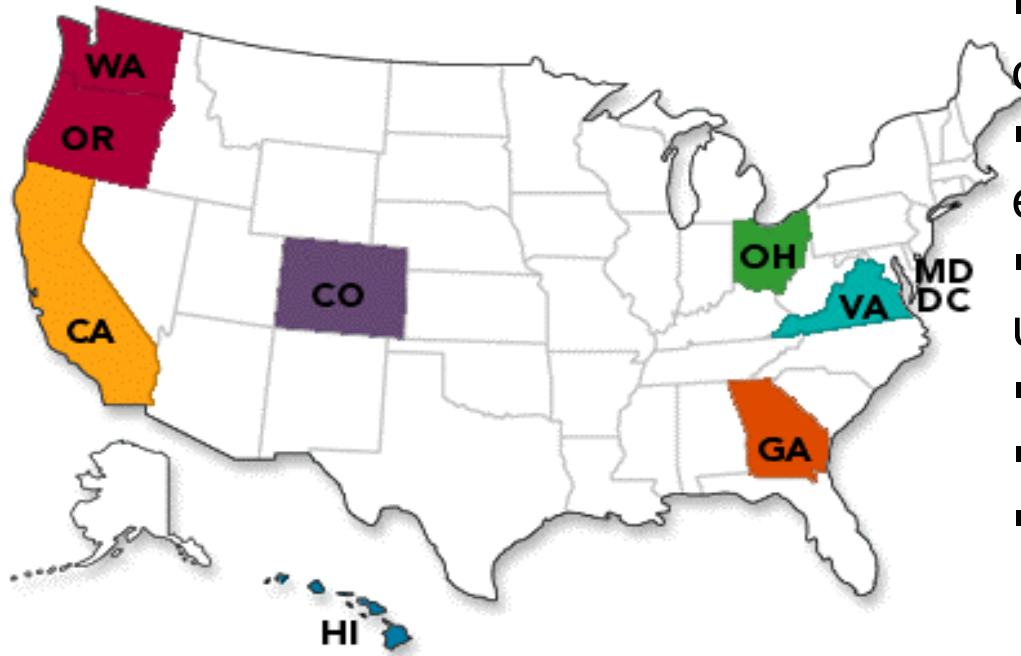


ePrescribing at Kaiser Permanente

David Campen, M.D.
TPMG Medical Director Pharmacy
November 20, 2008

Kaiser Permanente's Prescriptions By the Numbers



- >60 million prescriptions written and filled annually (nationally)
- For >6.5 million unique members, or >130,000 daily, in CA
- Nearly all prescriptions done electronically
- Generic use rate of >83% (>85% under Part D) in California
- >99.5% when generic is available
- >98% formulary prescribing –
- Open exception process
“No 1-800 Mother may I?”

Objectives

- Identify the benefits of the ePrescribing at Kaiser-Permanente
- Review ePrescribing workflows including Physician Order Entry, medication verification, drug interaction checking, refill management and weight based dose checking that enhance patient safety and compliance
- Discuss review tools for patient engagement in helping to manage their own healthcare

KP Standardized Order Entry

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

MRN Age Sex PCP Allergies Alert Spec Feat kp.org
71 Y F Lisinopril, Eggs (edible), Cozaar PrtD Inactive

Snapshot
Chart Review
Results Review
Allergies
Medications
Flowsheets
Problem List
History
Letters
Demographics
Scan
CIPS
Patient Report
Order Entry
Imm/Injections
Doc Flowsheet
Forms
eConsult
Refill Encounter

Order Entry (Enc Date: 11/17/2008) - Wt: (Not entered for this visit) Ht: (Not entered for this visit)

Association Pref List SmartSets Interactions Pharmacy Providers References Open Orders Pend Orders Sign Orders Financial Routing Drugs eConsult

Order: ☒ Both ☐ Medication ☐ Procedure

This patient has open orders.

Full Detail (F4)

Take	Req	F/S	Order	Dx	Detail
------	-----	-----	-------	----	--------

New Order Status Modifiers Cancel/Delete Select All Med Class Benefit CC Results ☒ Show placed orders F7 - Prev order F8 - Next order

Association: Selected Grid Auto Clear Replace LOS:

Diagnosis:

P Encounter Diagnoses (right-click dx for more options)

Add Add

Link	Problem List (right-click problem for more options)	Status
	RHEUMATOID ARTHRITIS [714.0B]	Active
	HYPERTENSION [401.9A]	Active
	OBESITY [278.00E]	Active

New Dx Delete Dx Annotate/Edit Dx Primary Dx

New Problem Edit Problem Resolve Now ☐ Show resolved

Hotkey List

KP Standardized Order Entry

- Fully electronic system
- 130,000 Prescriptions electronically transmitted directly to pharmacy computer system **every day**
- **NO** Faxes, No Transcription
- Only paper Rx's are for outside fills and for DEA Schedule 2 Drugs
- Linked tightly to fully electronic Medical Record
- Implemented in both Inpatient and Ambulatory

Order Entry – Medication Review

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

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Epic Home

MRN Age Sex PCP Allergies Alert Spec Feat kp.org
71 Y F Lisinopril, Eggs (edible), Cozaar PrtD Inactive

Snapshot
Chart Review
Results Review
Allergies

Medications

Med Notes New Rx Reorder/Change Rx Discontinue Reviewed Mark All Clear Filters Filters

As of now History

Prescription summary for this Visit (11/17/2008)

Medication	Sig	Disp	Refills	Ord/Sold Date	End Date	DAW	Co
HYDROCHLOROTHIAZIDE 25 MG ORAL TAB	Take 1 tablet orally daily for blood pressure control	100	2/3	09/19/2008 (S)	12/16/2009	No	
ATENOLOL 50 MG ORAL TAB	Take 1 tablet orally daily for blood pressure control	100	2/2	09/19/2008 (S)	12/16/2009	No	
METHOTREXATE SODIUM 2.5 MG ORAL TAB	Take 6 tablets orally every week for arthritis. DO LABS MONTHLY	60	0/1	09/11/2008 (S)	12/10/2009	No	
NEOMYCIN-POLYMYXIN-HC 3.5-10,000-1 MG-UNIT/ML-% OTIC SOLN	Instill 1 drop into each ear daily for itching	10	2/2	02/27/2008 (S)			

Current Active Medications

Medication List Comments

< Last reviewed on 2/25/2008 2:14 PM by ARLEEN NG MD >
< No filters applied.

Hotkey List
Exit Workspace

"S" Identifies that Rx sold

Rapid Access to Additional Rx Information

The screenshot displays the Epic Hyperspace web application interface. The top navigation bar includes the Epic logo, a 'Home' button, and a list of application areas: Desktop, Action, Patient Care, Scheduling, Reg/ADT, CRM/CM, Reports, Report Mgmt, Tools, Admin, and Help. Below this is a secondary navigation bar with icons for Back, Forward, Home, Schedule, In Basket, Chart, Enc, Tel Enc, Refill Enc, Ancil Ord Enc, Patient Lists, and Secure. The main content area is divided into three sections: 'Schedule' (red header), 'In Basket' (teal header), and 'Links' (purple header). The 'In Basket' section contains links for 'Pt: Reminder' and 'Staff Message'. The 'Links' section, titled 'KAISER PERMANENTE', lists various resources including 'What's New/How To', 'Ambulatory KPHC', 'Inpatient KPHC', 'Front Office', 'KP National Clinical Content Website', 'eConsult', 'Clinical Library', 'Clinical Images', 'Physician Home Page Info Site', 'Technology Group Website', 'Departmental Reports', 'Pharmacy Homepage' (highlighted with a red circle), 'Rx Conversion', 'PEDI BMI TOOL', 'eDME', and 'Secure Messaging/Online'. A red box with the text 'Pharmacy Homepage' is overlaid on the 'Schedule' section, with a red line pointing to the highlighted link in the 'Links' sidebar. The bottom of the screen shows a Windows taskbar with the 'start' button and several open applications: WebEx One..., GoToMeeting..., Epic Hyperspace..., Internet..., and another GoToMeeting instance. The system clock indicates 9:40 AM.

Pharmacy Homepage

Clinical Decision Support

■ Improved Monitoring (linked to refilling)

- Medication Adherence
- Lab

■ Alerts

- Drug-Drug
- Drug-Allergy
- Formulary
- Weight Based Dosing (Pediatrics)

■ Structured Order Sets

- Inpatient
- Oncology

Medication Refills - Lab

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Rx: RAR - 1 New of 2

New Msg Refresh Sort Search Display Properties EZ Approve Refuse Reassign Approve Sign Edit Msg/Notes Flowsheet Review

In Basket
Pt. Reminder
Results (3)
Rx: RAR (1)
Chart: CC'd Chart
Remote In Basket Prev
Out Basket

P	Status	F/U	Date	Patient	Medication	Clas...	Rx Prescriber
	Pend						
	Pend		10/28/08		TOLAZAMIDE 250 MG ORAL TAB		Campen, David ...

Tolinese 250mg refill request

In Basket Hotkey List

Links Copy Refresh Print Resize

Rx Refill Response
Response

Action taken: Approve	Action by: CAMPEN, DAVID HOWARD (M.D.)	Date: 10/29/08	Time: 7:46 AM
Medication: TOLAZAMIDE 250 MG ORAL TAB			
Sig: Take 1 tablet orally 2 times a day for diabetes			
Refills approved: 5	Quantity: 200	End date: 1/28/10	

Rx Refill Request
Request

Patient:	Date: 10/28/08	Time: 9:07 PM
Medication: TOLAZAMIDE 250 MG ORAL TAB		
Sig: Take 1 tablet orally 2 times a day for diabetes		
Refills remaining: 0/5	Last refill: 10/28/08	End date: 1/28/10
Refills requested: 5	Quantity: 200	Pharmacy: LVR CPP/MAIL #253

Medication Refills - Lab

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Rx: RAR - 1 New of 2

New Msg Refresh Sort Search Display Properties EZ Approve Refuse Reassign Approve Sign Edit Msg/Notes Flowsheet Review

P	Status	F/U	Date	Patient	Medication	Clas...	Rx Prescriber
	Pend	P	10/29/08				Campen, David ...
	Pend		10/28/08		TOLAZAMIDE 250 MG ORAL TAB		Campen, David ...

Tolinase 250 mg refill request


In Basket Hotkey List

LAST LABS

LAST APC LAB:

WBC	12.4	12/13/2006
HCT	40.8	12/13/2006
HGB	14.2	12/13/2006
PLT	227	12/13/2006
CHOL	178	06/24/2008
HDL	28	06/24/2008
LDL CALC	NOT DONE	06/24/2008
TRIG	514	06/24/2008
CREAT	1.26	06/24/2008
K	4.7	01/02/2007
NA	141	01/02/2007
CO2	26	01/02/2007
CL	105	01/02/2007
PSA	2.0	02/01/2007
HGBA1C %	6.6	06/24/2008

Instantly check HbA1c



Medication Refills - Adherence

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Age Sex Mult PCP Allergies Alert Spec Feat kp.org
62 Y F Campen, David Howard *Penicillins Class, Co-trimoxazole, Metho* PrtD Inactive

Snapshot Medication Report Close X


Chart Review Results Review Report Viewer Allergies Medications Flowsheets Problem List History Letters Demographics Scan CIPS Patient Report

KAISER PERMANENTE

Medication TOLAZAMIDE 500 MG ORAL TAB

Medication Detail	Quantity	Refills	Start	End
TOLAZAMIDE 500 MG ORAL TAB Sig: Take 1 tablet orally 3 times a day Route: Oral Order #:	200	3/5	11/11/2008	2/11/2010

Order Providers Prescribing Provider Encounter Provider
David Howard (M.D.) Campen David Howard (M.D.) Campen

Dispense Hx for This Rx #	Refill No.	Medication	Quantity	Refills Remaining	Date
	3	TOLAZAMIDE 500 MG ORAL TAB	200	3	11/11/08
	2	TOLAZAMIDE 500 MG ORAL TAB	200	4	9/10/08
	1	TOLAZAMIDE 500 MG ORAL TAB	200	5	7/1/08

Order Release Information Order Date and Time Department
7/1/2008 5:56 PM Sch-Rhe1 >Main Campus

Release Information	First Scheduled For	Released Date	Released By
1.	Sun Nov 16, 2008 7:45 AM	Tue Jul 1, 2008 5:56 PM	User Pims

All Inpatient Administrations of TOLAZAMIDE 500 MG ORAL TAB

Hotkey List Exit Workspace Back Links Copy Refresh Print

Responses to DDI (and other) Alerts

- When a DDI alert fires, the provider can:
 - ✓ Accept the alert
 - Cancel the drug order the you just entered
 - Remove the drug order that was already present
 - ✓ Override the alert
 - Continue with original prescription; both drug orders remain active

Drug-Drug Interaction Alert

Medication Alerts

Current Alerts

Group by
 ☒ Importance
 ☐ Type
 ☐ Orders
 ☐ Set as startup option
 ☒ Expand
 ☐ Collapse

Summary N/A

● - Current
■ - Existing
✗ - Ended
✓ - Verified
● - Given
Show Legend

Type	Significance	Description	Order(s)	Override Reason/Comment
<div> <div>N/A</div> <div>Overridden (1)</div> </div>				
Allergy	Drug class...	⊕ HYDROCHLOROTHIAZIDE Reactions: None specified Type: None specified Comments: 2004-06-01;photosens. rash	● CHLORTHALIDONE 25 MG ORAL TAB	<div> <div>Howard 11:23 AM. currently</div> <div> Benefits outweigh risks Expected side effect Insignificant Intolerance dose Low risk No good alternative Not a true allergy Not clinically significant Pharmacist Review Previously or currently tolerated </div> </div>

Override Reason

Comments

Immediately override and accept all alerts with this reason:

Level 1 DDI Alert Rates (KP NoCal 4Q07)

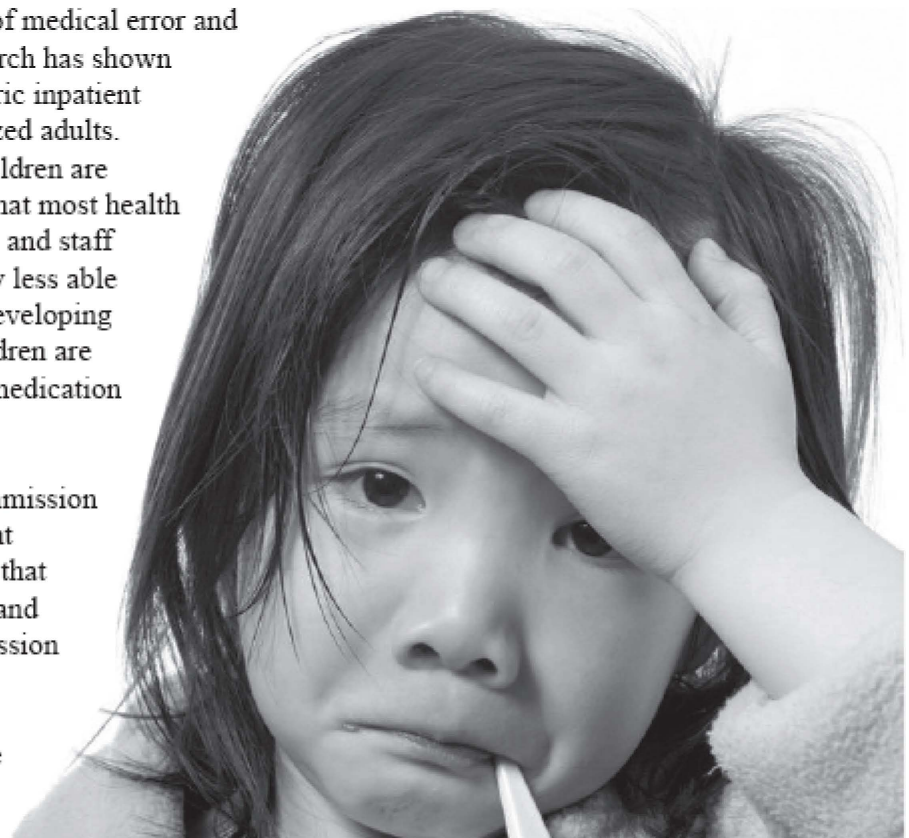
- Level 1 = Contraindicated unless managed
- 23,872 Level 1 DDI Alerts fired to prescribers
- 1 alert per 185 patient encounters
- 1 alert per 106 OP Rx orders
- **22% Accepted (4Q07)**
 - In 2005 (before analysis and promotion/demotion, only 15% accepted)

Pediatric Dosing Alerts

Working to Prevent Pediatric Medication Errors

Medication errors are seen as the most common type of medical error and as a significant cause of preventable adverse events. Research has shown that the potential for adverse drug events within the pediatric inpatient population is about three times as high as among hospitalized adults. One reason is that most medications used in the care of children are formulated and packaged primarily for adults. Another is that most health care settings are primarily built around the needs of adults, and staff often lacks pediatric-oriented training. Children are usually less able to physiologically tolerate a medication error due to still developing renal, immune and hepatic functions. And very young children are not able to effectively articulate the adverse effects that a medication may be causing.

To address pediatric medication issues, The Joint Commission issued a “Sentinel Event Alert” on April 11, 2008. The Joint Commission is an independent, not-for-profit organization that accredits and certifies more than 15,000 care organization and programs in the United States. The Joint Commission’s mission is to continuously improve the safety and quality of care provided to the public through the provision of healthcare accreditation and related services that support performance improvement in health care organizations.



Script July 2008 pg. 16

Pediatric Dosing Alerts

ff MRN Location Age: 12y Dx Allergies Ht: -- BSA: --
SACPED-PED-3B Sex: M Tonsillector* NO KNOWN ALLERGIES Wt: -- CrCl: --

Place orders Resize

New Order Interactions Providers Reports Pended/Held Pend Orders Sign & Hold Sign & Verify Sign Orders Order Set

☐ Problem List
☒ Selected Orders

New order: Search Next Edit Multiple...

Order mode: Standard **Order defaults: Not using defaults**

Medications (1)

Ampicillin IVPB 3 g (OMNIPEN-N) Remove

3,000 mg = 3 g, Intravenous, EVERY 6 HOURS, First Dose Today at 1600 Until Discontinued

F7- Prev Order F8- Next Order

Ampicillin Order 3gm every 6 hours for 12 year old

Pediatric Dosing Alerts

The screenshot displays the 'Medication Alerts' window. At the top, there are tabs for 'Current Alerts' and 'Report'. Below these, a 'Group by' section includes radio buttons for 'Importance', 'Type', and 'Orders', along with a checkbox for 'Set as startup option'. To the right are 'Expand' and 'Collapse' radio buttons. A 'Summary' section shows 'N/A (1)'. A legend bar contains status indicators: a red dot for '- New', a blue square for '- Existing', a red X for '- Ended', a green checkmark for '- Verified', and a green circle with 'G' for '- Given', followed by a 'Show Legend' button. The main table has columns: 'Type', 'Significance', 'Description', 'Order(s)', and 'Override Reason/Comment'. A single alert is listed with 'Type' as 'Dose', 'Significance' as '↑ Daily', and 'Description' as '⊕ AMPICILLIN SODIUM 1 GRAM INJ RECON SOLN: exceeds recommended maximum daily dose by 50% (4,000 mg)'. The 'Order(s)' column shows '● Ampicillin IVPB 3 g (OMNIPEN-N)' with a 'Remove' link. The 'Override Reason/Comment' column has a dropdown menu and a document icon. A 'New (1)' button is in the top right corner of the table area.

Type	Significance	Description	Order(s)	Override Reason/Comment
Dose	↑ Daily	⊕ AMPICILLIN SODIUM 1 GRAM INJ RECON SOLN: exceeds recommended maximum daily dose by 50% (4,000 mg)	● Ampicillin IVPB 3 g (OMNIPEN-N) Remove	<input type="text"/> New (1)

- Built in warnings about maximum dosing alerts at time of order entry

Structured Orders Sets - Oncology

Treatment Plan Manager - ONCA BLADDER CISPLATIN GEMCITABINE Q4WEEK [666] [Close X]

Add
 Delete Selected
 Dose Reduction
 Change View
 Treatment Info
 D/C Plan
 Cumulative Dose
 Review Flowsheet

Treatment plan: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Most recent: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Difference: No change No change

Cycle	Day	Date	Status	Actions
Cycle 1		10/3/2007, Planned		
+ Day 1, Cycle 1		10/3/2007, Planned		Add Order Add Order Group Add Blank Day Copy Paste Delete Complete Day Defer Day Cancel Day
+ Day 8, Cycle 1		10/10/2007, Planned		
+ Day 15, Cycle 1		10/17/2007, Planned		
Cycle 2		10/31/2007, Planned		
Cycle 3				
Cycle 4				

Treatment Plan Manager - ONCA BLADDER CISPLATIN GEMCITABINE Q4WEEK [666] [Close X]

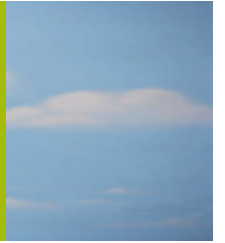
Add
 Delete Selected
 Dose Reduction
 Change View
 Treatment Info
 D/C Plan
 Cumulative Dose
 Review Flowsheet

Treatment plan: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Most recent: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Difference: No change No change

Cycle	Day	Date	Status	Actions
Cycle 1		10/3/2007, Planned		
+ Day 1, Cycle 1		10/3/2007, Planned		
+ Provider Reminders				
+ Orders				
APREPITANT 80 MG ORAL CAP		Take 1 capsule PO daily on days 2 and 3 after chemotherapy to prevent nausea and vomiting, Disp-2, R-0, Oral, starting S, Pharmacy - In formulary		
DEXAMETHASONE 4 MG ORAL TAB		Take 8 mg (2 tablets) PO daily days 2, 3, and 4 after chemotherapy to prevent nausea and vomiting, Disp-6, R-0, Oral, starting S, Pharmacy - In formulary		
+ Premedications				
+ Chemotherapy				
Gemcitabine IVPB 1.71 g		1,000 mg/m2 = 1.71 g, Intravenous, ONE TIME, 1 dose starting S at 0000 **Caution: Chemotherapy**		
Cisplatin 119.7 mg in Sodium Chloride 0.9 % 1,000		Intravenous, ONE TIME, 1 dose starting S at 0000		

Save Restore

Keys to appropriate electronic alerts



- **Efficiency**

- Should respect clinician's time

- **Usefulness**

- Must be accurate and relevant

- **User Interface**

- Should have right level of intrusiveness

- **Information Content**

- Should give right amount of information

- **Workflow**

- Must present at the right time in the visit

- **Communicate, Communicate, Communicate**

Patient Involvement

- Kp.org - Patient healthcare access site
 - General self help medical information
 - 40% of Membership
 - eMail you physician
 - eRefill prescriptions
 - “My Prescriptions” section
 - Shows current active prescriptions seen by all healthcare professionals within Kaiser-Permanente
 - 800 Telephone number to live pharmacist for medication questions

My Prescriptions

[My health manager](#) [Health & wellness](#) [Health plans & services](#) [Locate our services](#)

Your prescriptions

- Help

[Printer-friendly version](#)

The prescription list below includes medications currently prescribed for you by a Kaiser Permanente practitioner. The list may not include medications that you fill outside of Kaiser Permanente pharmacies, or medications that you purchase over the counter.

ZILACTIN-B 10 % MM GEL
[About This Medication](#)
Instructions: Use As Directed
Prescribed by A X CEMD MD on 03/20/08
Prescription number: 6310054884

If you have specific questions about the information on this page, please call a pharmacy representative at 1-866-301-3480 (toll free).
If you have specific questions about the information on this page, please call (NCA) 223-3333.

For your convenience, [refill prescriptions](#) online. If your bottle says 0-refill, you can still request a refill.

ePrescribing - Caution

- Alert Fatigue
- Provider Acceptance
 - Engage **early** in process
 - Be responsive to need for change
- Not all ePrescribing is the same
 - Stand alone systems
 - Fax Interfaces
 - Some interfaces One-Way only
 - Many lack integration to Electronic Medical Record
 - Linkage of Inpatient vs. Ambulatory

Summary - ePrescribing

- Improves Medication Safety
- Opportunity to strategically focus decision support
 - Target high risk agents
- Supports safe prescribing across the continuum of care
- Caution with “Alert Fatigue”
- Huge Opportunity to involve patients