

Challenges in Optimizing Prescription Drug Use

The Role of Integrated E-Rx & Drug Management Systems

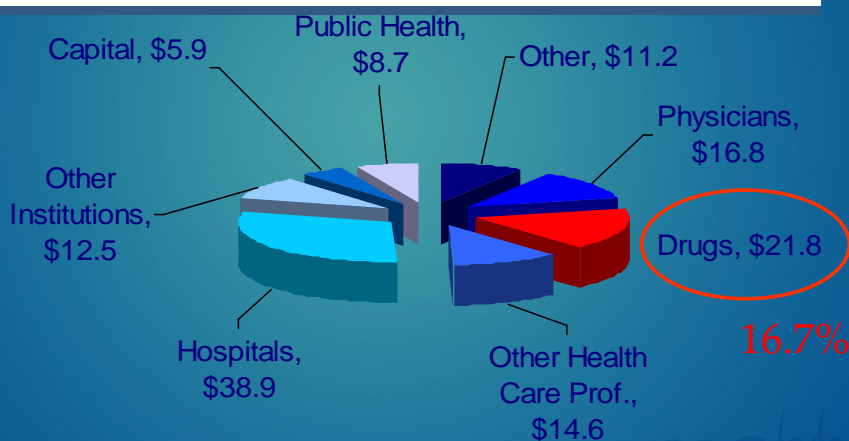


Robyn Tamblyn
McGill University

moxxi

Drug Costs are the Second Largest Sector of Expenditure in Health Care Costs

(Canada: \$130 Billion, 2004)

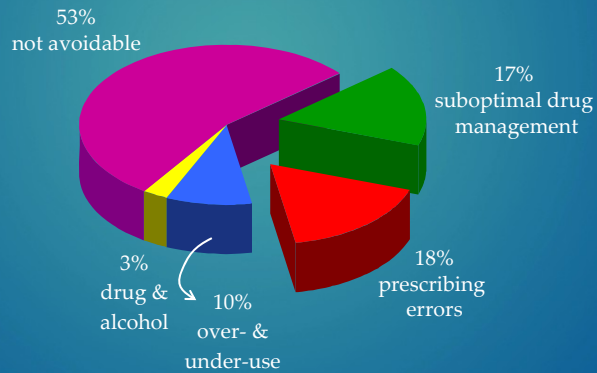


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Cette présentation a été effectuée le 27 octobre 2006, au cours du Symposium "Nouvelles technologies de l'information en santé publique : implications sur le terrain" dans le cadre des Journées annuelles de santé publique (JASP) 2006. L'ensemble des présentations est disponible sur le site Web des JASP, à l'adresse <http://www.inspq.qc.ca/jasp>.

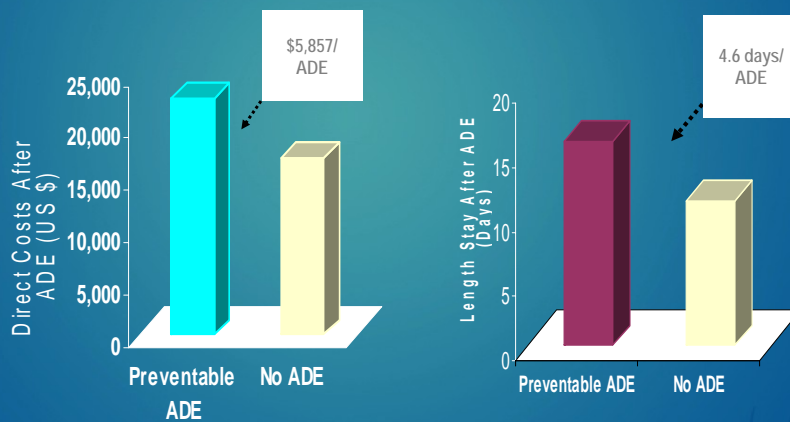
Almost Half of Hospital Admissions for Drug-Related Illness are Preventable

(Hallas, 1992)

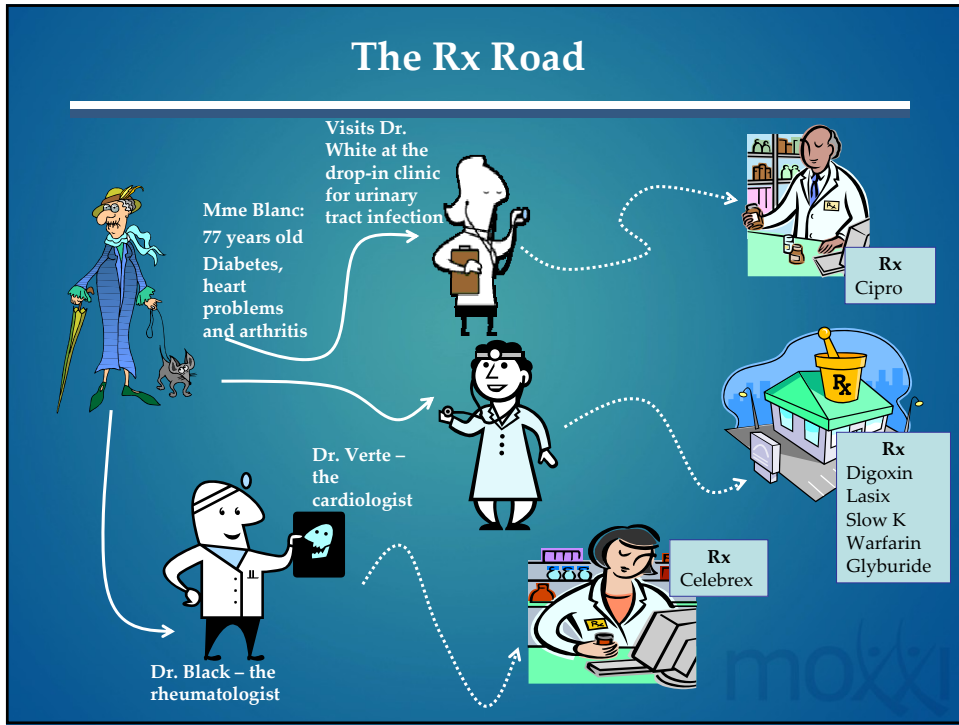


Direct Health Care Costs of Preventable Adverse Drug Events

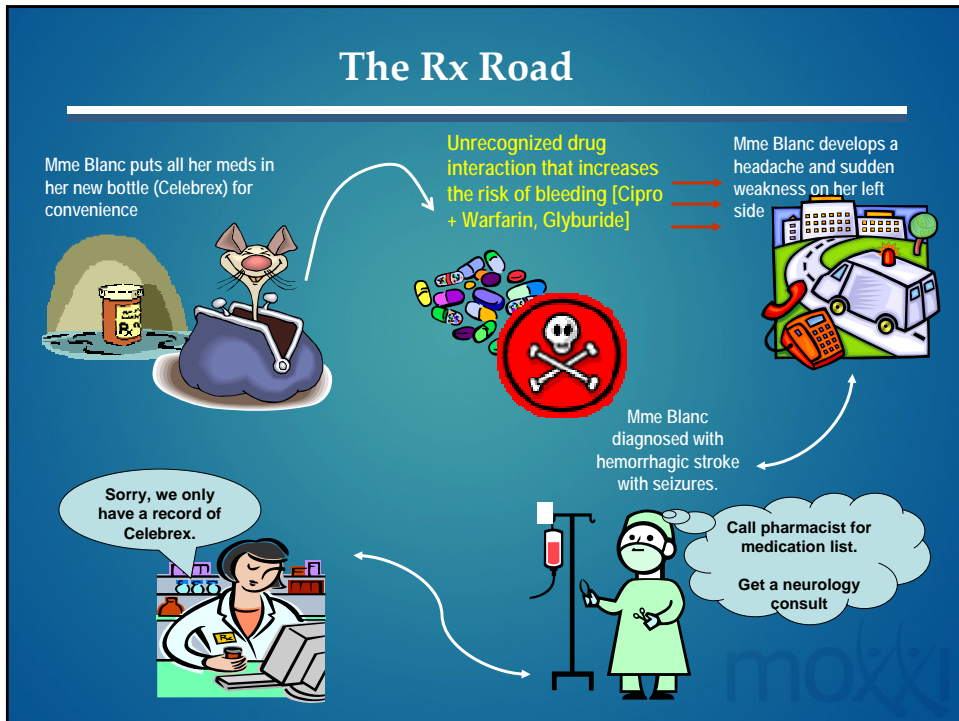
(Bates *et.al.*, JAMA, Vol 277 (4):307-311, 1997)



The Rx Road



The Rx Road

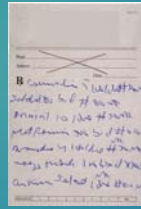


The Rx Road

Dr Grad, the neurologist starts Mme Blanc on Dilantin for seizures.



The pharmacist has trouble reading the rx and dispenses 400 mg of Dilantin—200 mg per day was prescribed



Mme Blanc is hospitalized for her hip fracture for surgery and rehab

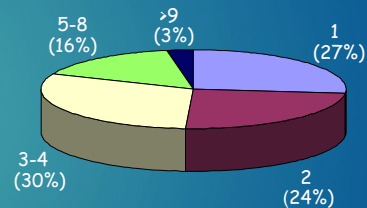
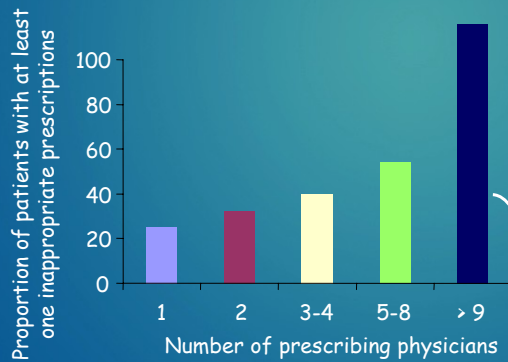


Mme Blanc is dizzy from too high a dose of Dilantin, falls down her steps, and fractures her hip



Multiple Prescribing Physicians Increase the Risk of Inappropriate Prescriptions

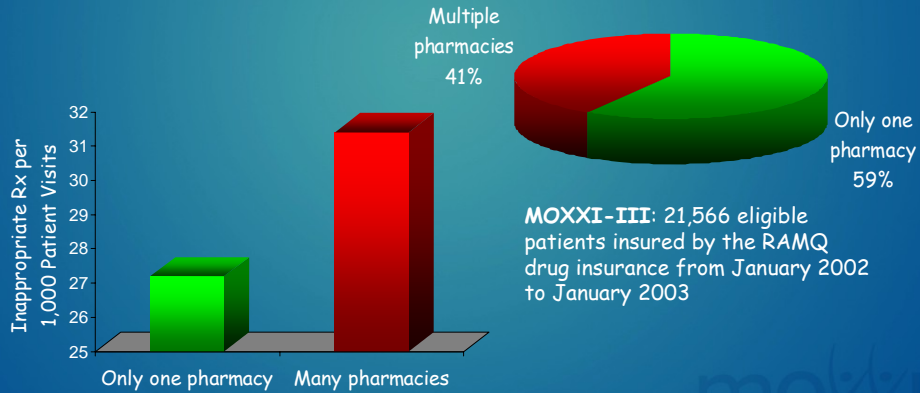
(Tamblyn et.al., CMAJ, 1993)



MOXXI-III: 21,566 eligible patients insured by the RAMQ drug insurance from January 2002 to January 2003

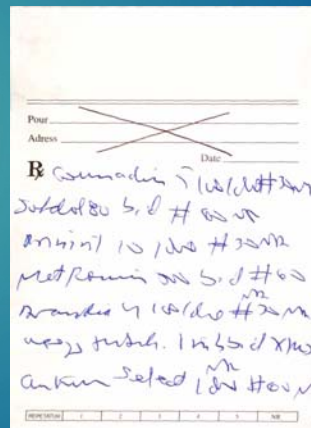
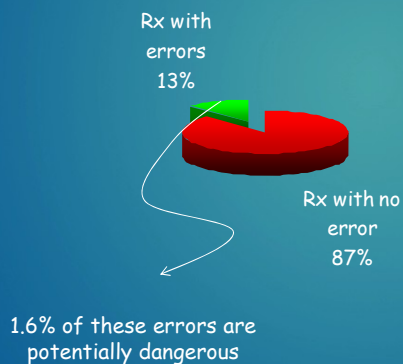
Multiple Dispensing Pharmacies Increase the Risk of Inappropriate Prescriptions

(Tamblyn *et.al.*, CMAJ, 1993)



Handwritten Prescriptions Increase the Risk of Transcription Errors

(Kistner, 1994)



Optimizing Drug Therapy

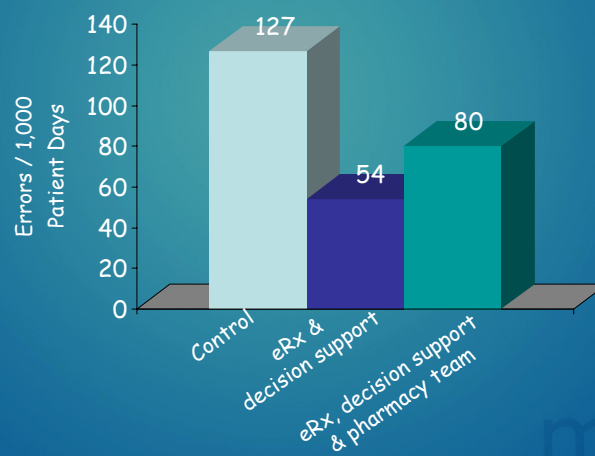
The Requirements

- Provide complete information on current drugs for physicians and pharmacists
- Reduce prescribing and transcription errors
- Improve the match between need and therapy
- Enhance compliance with treatment
- Improve cost-effectiveness of treatment: least expensive drug to achieve treatment effects

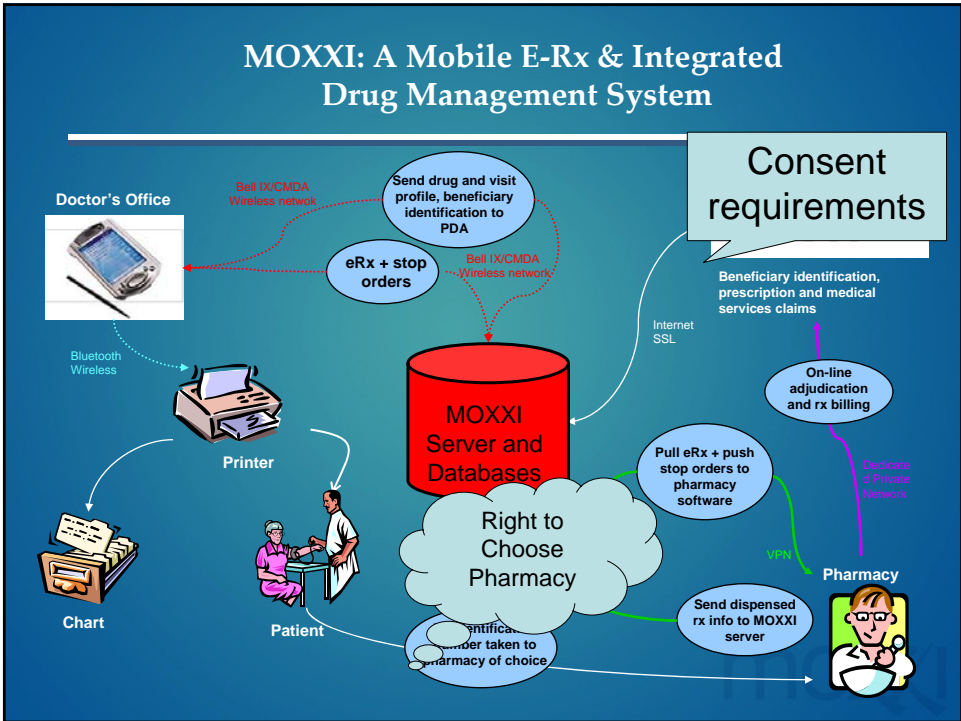
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Computerized Hospital E-Rx systems Reduce Medication Errors by > 50%

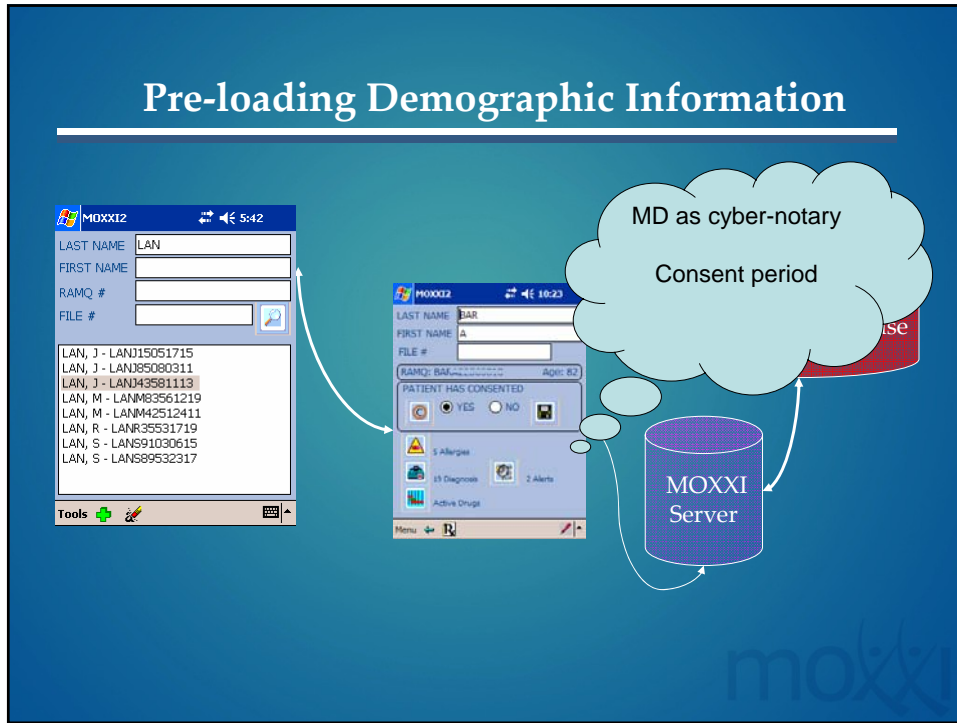
(Bates, JAMA, 1998)



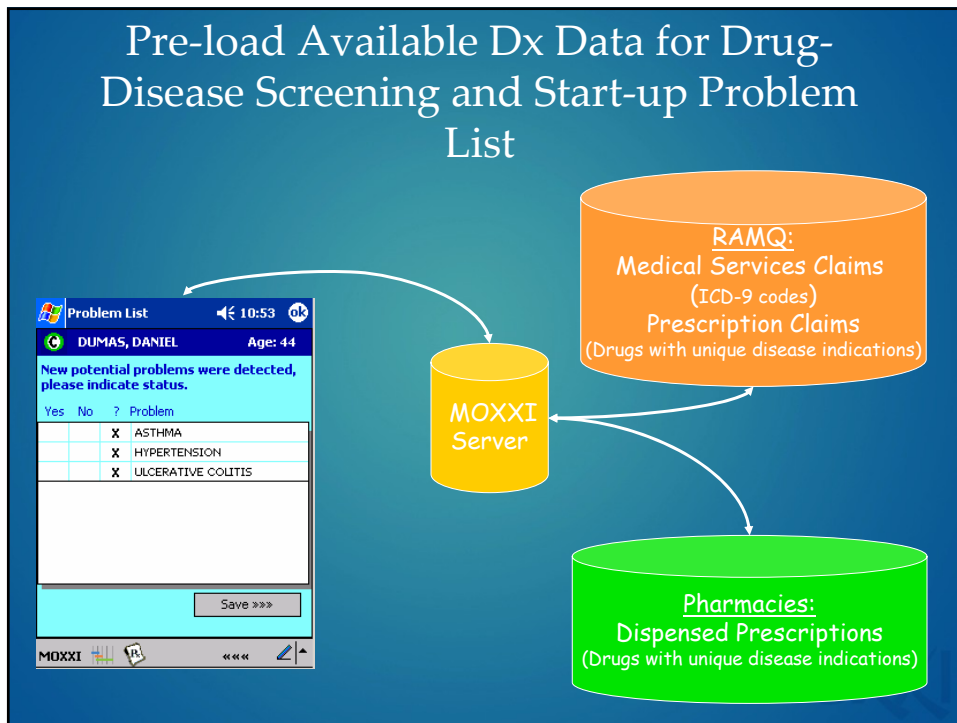
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Pre-loading Demographic Information

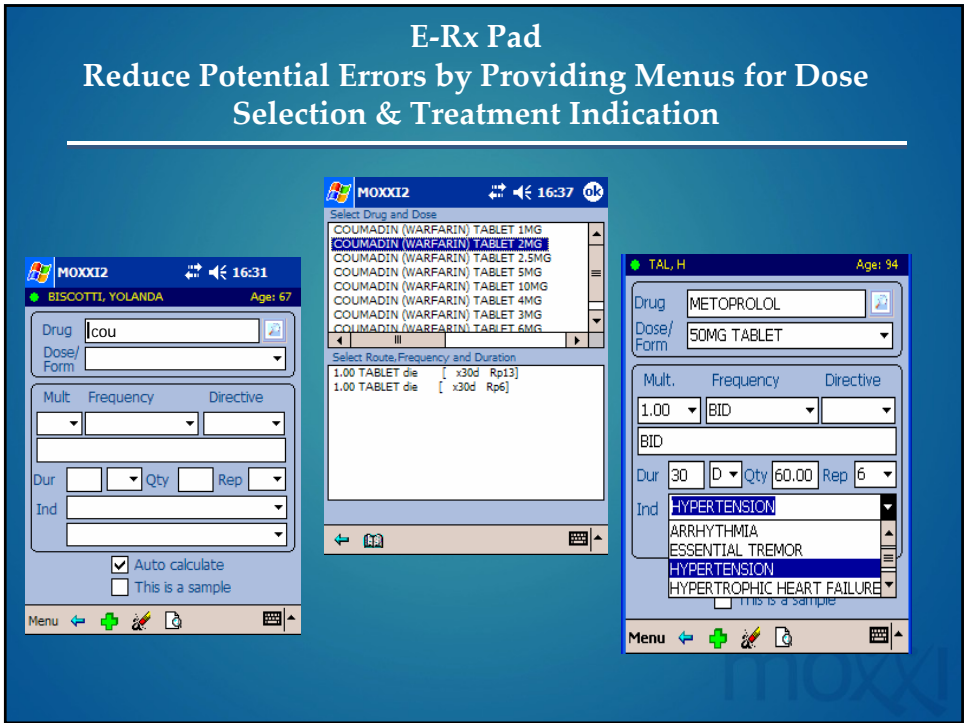


Pre-load Available Dx Data for Drug-Disease Screening and Start-up Problem List

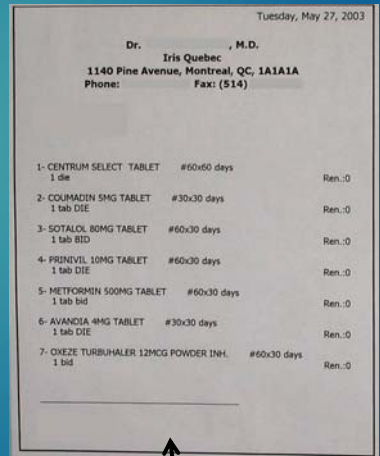
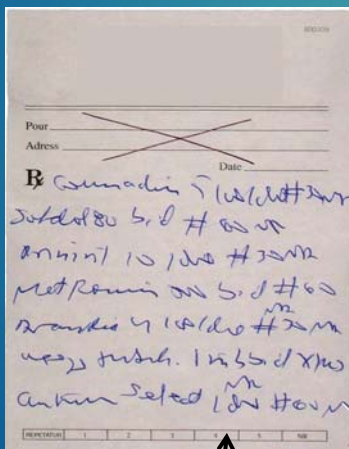


E-Rx Pad

Reduce Potential Errors by Providing Menus for Dose Selection & Treatment Indication

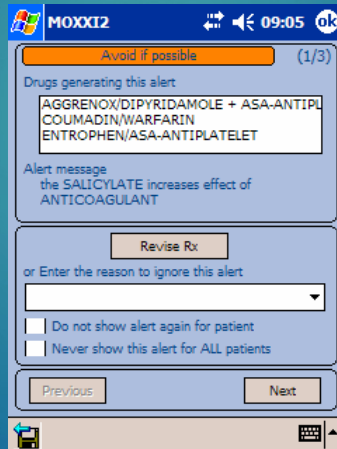


Avoid Transcription Errors by Printed Prescriptions

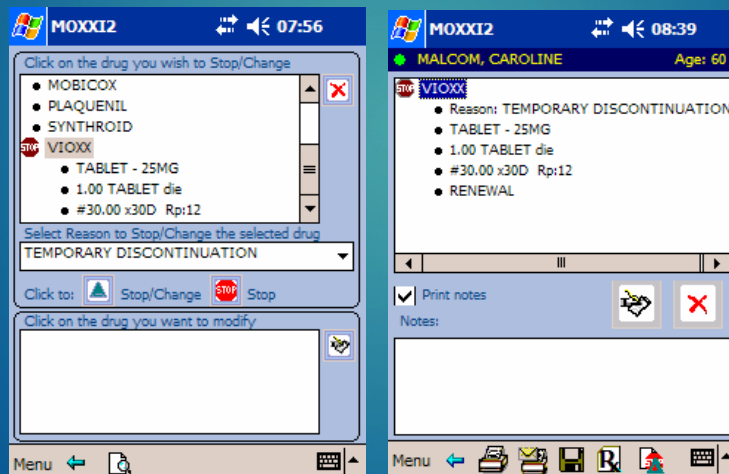


Handwritten vs. Electronic

Reduce Errors in Drug Selection by Providing Alerts for Prescribing Problems



Reduce Errors by Making it Easy to Communicate Stop and Change Orders



Avoid Transcription Errors by Electronic Retrieval and Integration of Prescriptions into Pharmacy Software

Identification de la prescription

Please enter the MD's prescription number requested

Numéro MD: B8K4L39Y

Cancel OK

Enter Prescription Number

Identification du client

Numéro MD: B8K4L39Y

Numéro de RAMQ: MONP78581804

Nom: P MON

Age: 25

Date de naissance: 1978-08-18

Sexe: Femme

Mauvais client Bon client

Verify client information

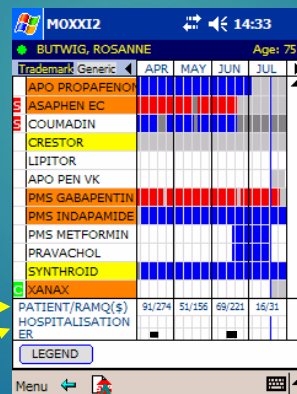
Trademark	Generic	Date	Remarque	Autre	Statut
1	LIPITOR 40MG CAPSULE	2004-02-12	0.5	0	0.00
5	PROPRANOLOL 1MG COMPRIME	2004-02-12	0.4	0	0.00
5	LISINAPRIL 10MG CAPSULE	2004-02-12	0.5	0	0.00
5	LIPITOR 40MG COMPRIME	2004-02-12	0.5	0	0.00
5	SYNTHROID 50MG COMPRIME	2004-02-12	0.5	0	0.00

Integrate prescription into software

Automated Tracking of Current Medications

List of Drugs Dispensed over Past 6 Months

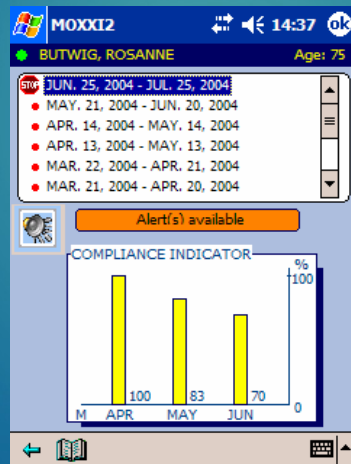
Costs of Medications
Dates of Hospitalizations & ER Visits



Legend

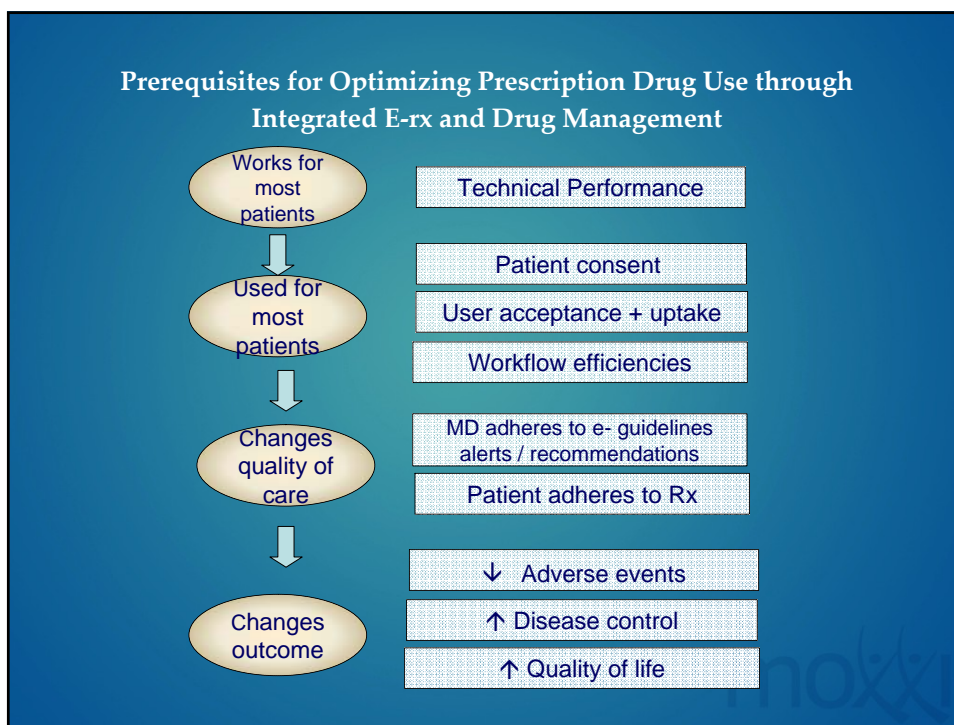
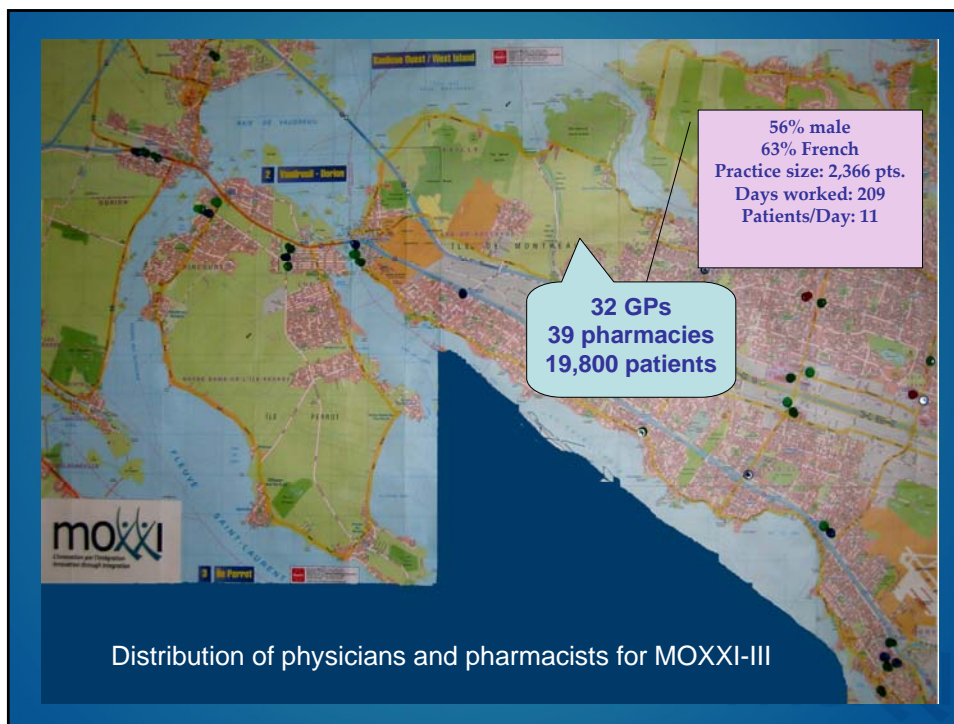
- Prescribed by this MD, but not dispensed
- Prescribed by this MD and dispensed
- Prescribed by another MD and dispensed

Assist Physicians in Identifying & Resolving Compliance Problems with Patients

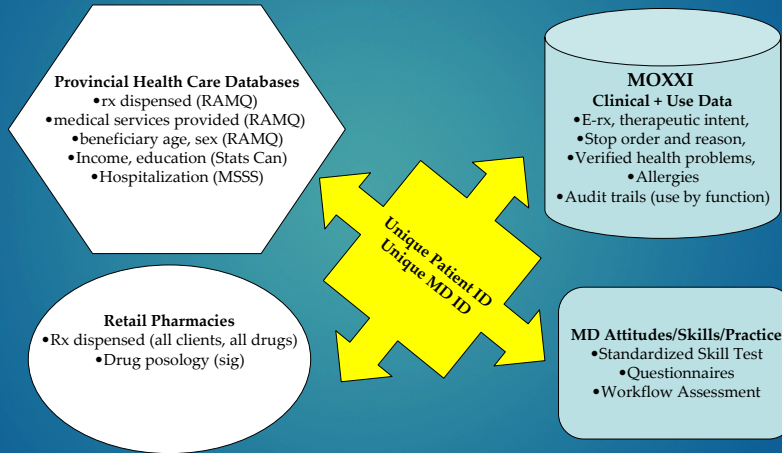


Assessing the Impact of Computerized Drug Management in Primary Care

Early Results from the MOXXI Trial



Data Sources Used in Assessment



Technical Performance of the System

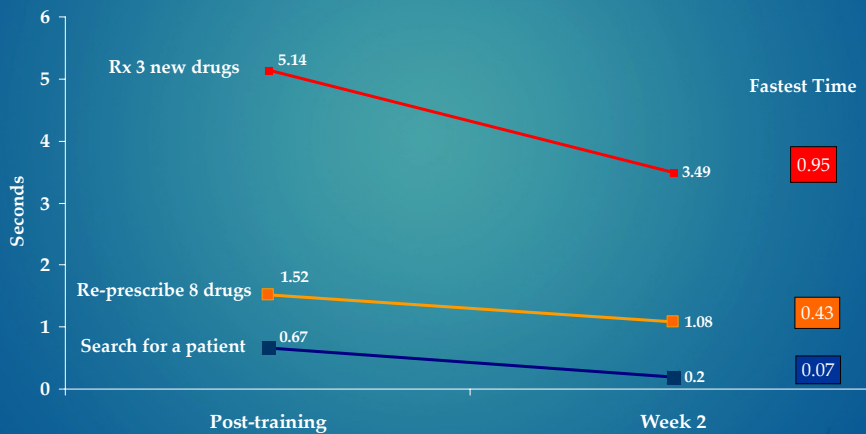
Technical Performance of the Integrated MOXXI System

Activity	Version 1 (Visual Basic) Jan 2003-April 2004 Mean time (sec)	Version 2 (C++) April 2004-Oct 2005 Mean Time (sec)
Entering a Rx (drug + sig)	3.86	1.15
Accessing Drug Profiler	23.13	1.44
Entering an Rx Indication	0.58	0.29
Receiving Alert from Rx-Pad	16.69	9.67
Save and Print a Prescription	49.93	28.31

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Physician's Ability to Write Prescriptions Electronically Improved Rapidly after Training

Standardized Task Assessment Results for 28 physicians

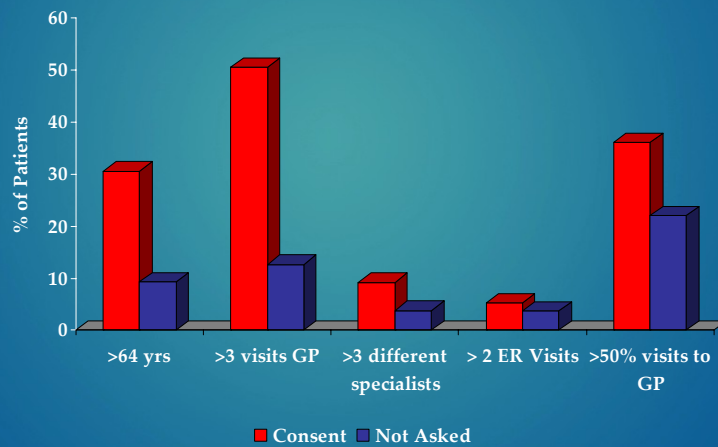


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Patient Consent

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Physicians Selectively Consented More Complex Patients who were seen More Frequently (n=32 MDs)



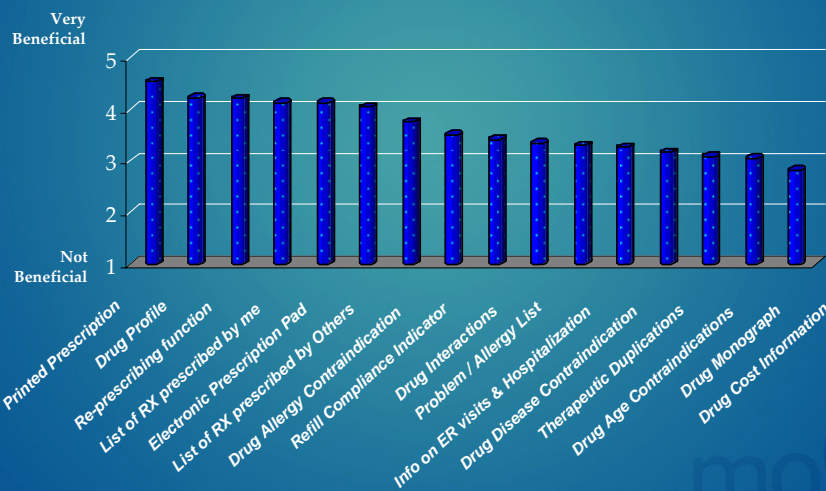
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Perceived Value of Different Functions within the MOXXI System

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Perceived Benefits of MOXXI Functions

Physician Questionnaire Ratings 8 Months Post-Implementation
(September, 2003)

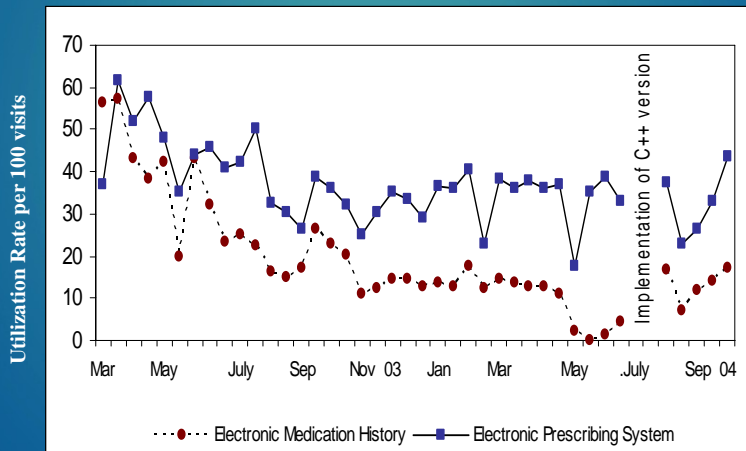


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Use of the MOXXI System in the First Year

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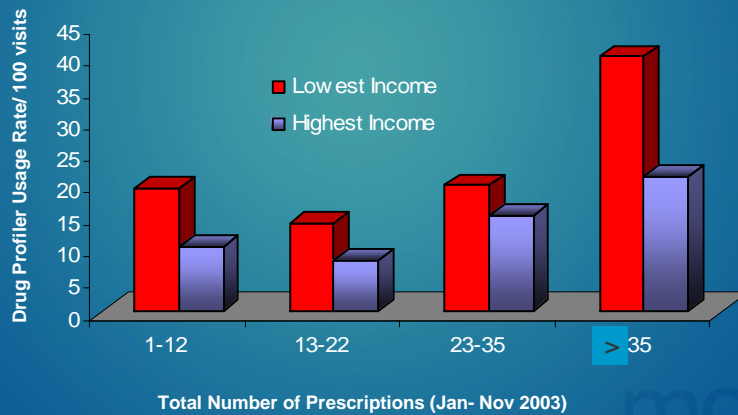
E-Rx and Drug Profile Utilization Rate per 100 Visits in the First 20 Months Post-Implementation



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Physicians Use the Drug Profiler for Patients with Multiple Drugs and Lower Income

Yuko Kawasami



Why are Psychotropic Medications Prescribed?

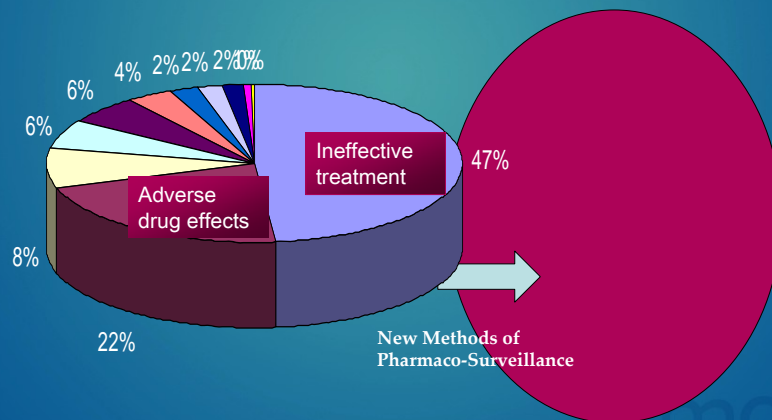
New Information for Policy and Intervention for \$232 - \$754 M in Fall-Related Injuries/ Year

(Treatment Indications for 6,319 e-Rx)

DRUG GROUP	INDICATION	FREQUENCY (%)
Antidepressants	Depression	59.7%
	Anxiety Disorder	13.5%
	Insomnia	9.4%
	Panic Disorder	3.3%
	Pain	3.2%
	Migraine	2.5%
	Neurogenic Pain	1.7%
	Other	6.7%
Benzodiazepines	Insomnia	49.4%
	Anxiety	43.1%
	Other	7.5%
Anti-psychotics	Depression	35.7%
	Psychosis	17.0%
	Schizophrenia	11.5%
	Bipolar Disorder	9.3%
	Other	26.5%

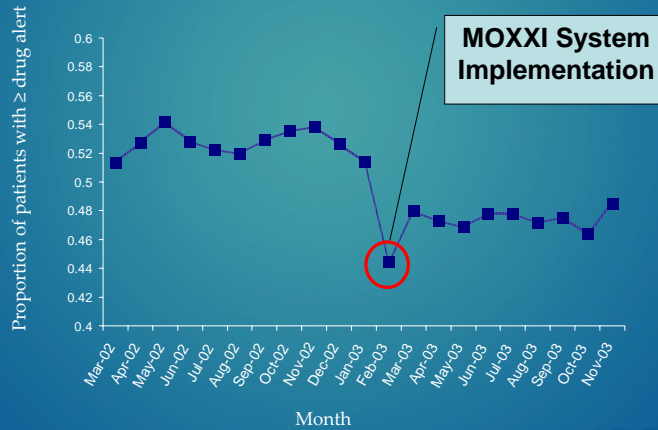
Why do Physicians Stop Medications?

Reasons for Stop Orders written for 857 of 3889 Patients Seen
Between Nov, 2005- Jan, 2006



Impact of E-Rx and Integrated Drug Management System on the Prevalence of Potential Prescribing Problems

Prevalence of Problems by Month (Drug-Disease, Excess Dose, Drug Interactions & Therapeutic Duplications)

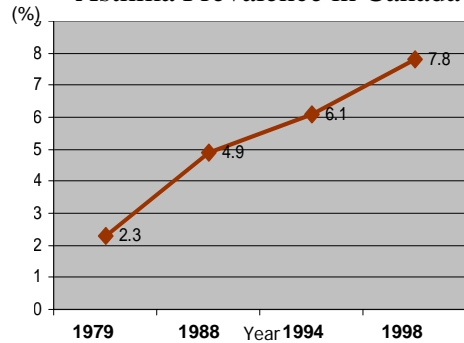


Integrated Drug Management Systems
Provide New Opportunities for Optimizing
Chronic Disease Management and Cost-
Effective Therapy

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Care Gaps in Asthma Management Contribute to Avoidable ER Visits and Hospitalization

Asthma Prevalence in Canada



(Health Canada, 1998 & Statistics Canada, 1997)

Cost of Asthma in 1990

Total : \$ 600 Million

Hospitalization : \$135 Million

(Krahn et al., CMAJ, 1996)

Integrating Asthma Decision Support

Using the Rx Indication to determine diagnosis & Dashboard Alert for Excess
Use of Fast-acting Beta-agonists + ER Visits

Quality

Rx Pad 5:27

DUF, E Age: 25

Drug: SALBUTAMOL Search

Generic Trademark

Dose/Form: 1MG/ML INH.NEBULE

Pos: 1 dose QID

Dur: D Qty: 40

Rep: ASTHMA, EXERCISE INDUCED BRONCHITIS

Ind: BRONCHOSPASM, COPD, EMPHYSEMA, RENEWAL

MOXXI Sample Preview

Patient Information 10:05

LAST NAME: SMITH

FIRST NAME: MARY

AGE: []

RAMQ #: []

FILE #: 912

CONSENT: No Yes

Save Changes

ASTHMA CONTROL: ***POOR***

1) 3 respiratory-related ER visits

2) Excess fast-acting B2 agonist use

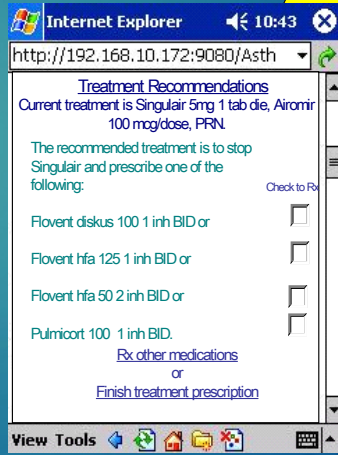
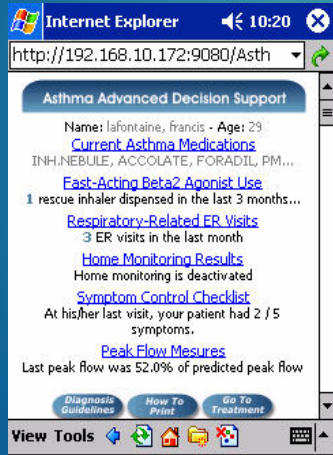
ACCESS ASTHMA TREATMENT RECOMMENDATIONS?

Yes No No asthma

MOXXI

Making it Easy to Provide Evidence-Based Assessment and Treatment of Asthma

Generating Patient-Specific Treatment Recommendations Based on Asthma Control and Current Drugs



The MOXXI Team

Research Team

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- Régie de l'assurance maladie du Québec
- Association québécoise des pharmaciens propriétaires
- Direction de la santé publique de Montréal-Centre
- McGill University Health Center
- Vigilance Santé
- HP, Bell Mobilité, SIP, DLD, Pharmaprix, Jean Coutu

Funders

- Canadian Institutes of Health Research
- Health Canada