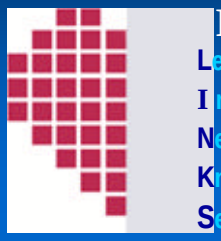
ONTARIO CARDIAC REHABILITATION PILOT PROJECT EVALUATION



Leadership
Innovation
Networks
Knowledge
Service

GTA Rehab Best Practices Day
February 18, 2004
Toronto

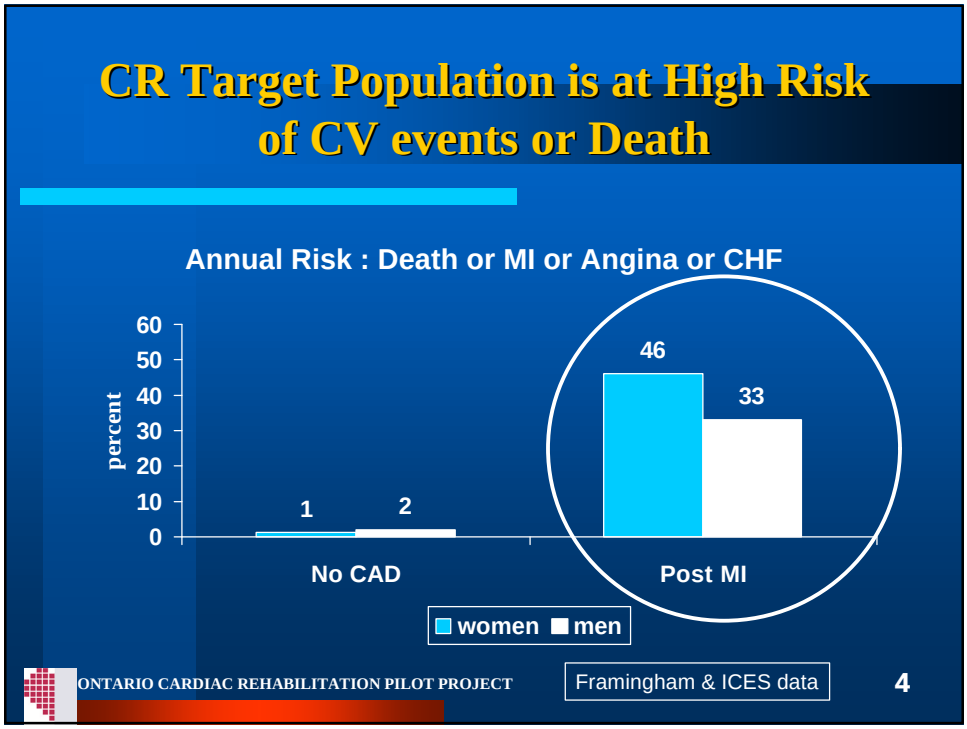
Terri Swabey, Cardiac Care Network of Ontario
Neville Suskin, London Health Sciences
Heather Arthur, McMaster University

Funded by the Ontario MOHLTC

CardiacCareNetwork of Ontario

Agenda

- The evidence for Cardiac Rehabilitation
- Context for CR Pilot Project
- Project Model and Implementation
- Key CR Pilot Findings
- Conclusions


CR Target Population is at High Risk of CV events or Death
Annual Risk : Death or MI or Angina or CHF
percent
60
50
40
30
20
10
0
1
2
46
33
No CAD
Post MI
women
men
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Framingham & ICES data
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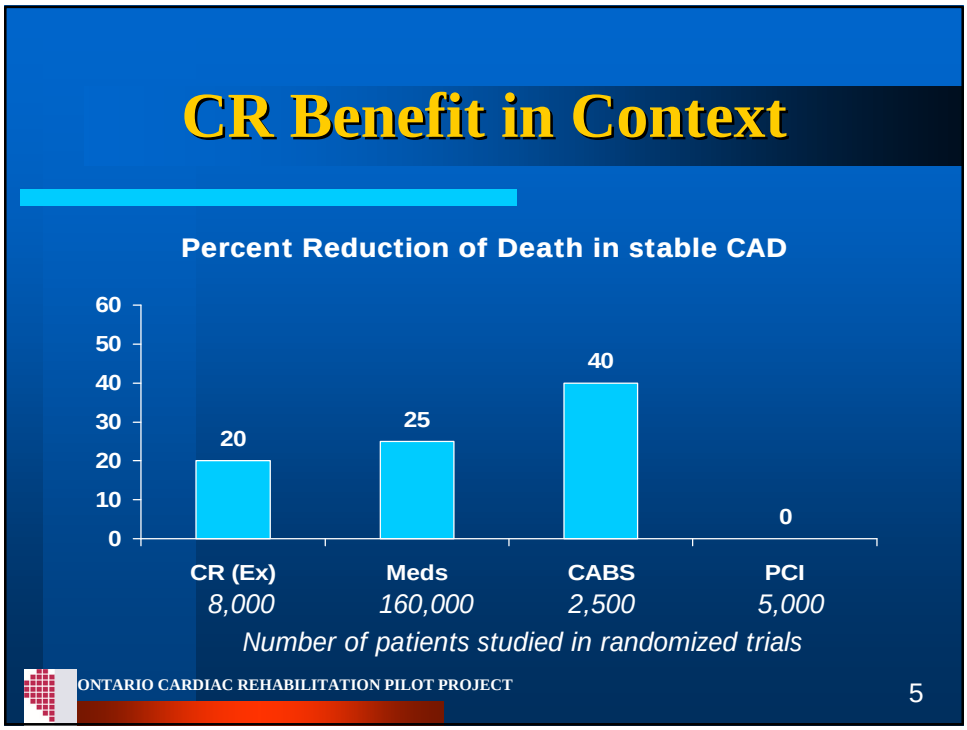
CR Benefit in Context
Percent Reduction of Death in stable CAD
60
50
40
30
20
10
0
20
25
40
0
CR (Ex)
8,000
Meds
160,000
CABS
2,500
PCI
5,000
Number of patients studied in randomized trials
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The Evidence

The interventions that comprise CR:

- Substantially reduce mortality & re-admissions
- Favorably modify cardiovascular risk factors
- Are cost-effective by customary criteria

Multifactoral CR is recommended as a minimum standard of care for patients with CV disease by national organizations in Canada and U.S.A

National Recommendations

Cdn Cardiovascular Society/Cdn Association of CR

- 1995 post MI guidelines
- 1998 Consensus on “secondary prevention”
- 1999 CR Guidelines

Am. College of Cardiology/ Am. Heart Association

- 1999 Post MI guidelines
- 2001 Guidelines on “secondary prevention”
- 2002 Guideline on Chronic Stable Angina
- 2002, 33rd Bethesda CV prevention conference

The Evidence – however …

- Poor participation in CR (< 20% eligible patients)
- Gaps in existing services:
  - Uneven service provision
  - Lack of organization and coordination
  - Lack of referral strategies
- Is CR Pilot Model effective?
- Can CR be delivered in the real world to a large group of patients at a reasonable cost?

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Context

1996 - CCN's report "Planning for the Future of Cardiac Services in Ontario"

- *CR part of the continuum of cardiac care*
- *Recommendation for a panel to review the delivery of CR in Ontario*

1999 - CCN Consensus Panel Report on Cardiac Rehabilitation and Secondary Prevention

- *Efficacy evidence for CR confirmed*
- *Recommendation for a pilot to evaluate a regional coordination model of CR*

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CCN Consensus Panel 1999

Key Recommendations:

- Minimum service guidelines
- Standardized patient provincial data registry
- Regional coordination model of care delivery
- CR Integration into the existing system of cardiac care
- Pilot to evaluate the recommended model of care

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Ontario CR Pilot Project

- Announced by Min. of Health Feb 2001
- 15 month Pilot (extended to 21 months)
- $ 9.6 million funding from MOHLTC
- Largest known evaluation of comprehensive CR services
  - 24 Pilot sites - 9 existing/expanded sites, 8 new sites + 7 new satellites
  - a new provincial patient database
  - To evaluate a standardized regional coordination model of care delivery and improve access to care

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Pilot Site Locations

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Objectives of the Pilot

1. Strategies to improve access and coordination
2. Improve health status/well being
3. Assess generalizability of model
4. Conduct needs-gap analysis of services
5. Recommendations for future planning in Ontario

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Evaluation

Six evaluation Themes

1) access
2) quality of care
3) health and well-being
4) resource utilization
5) costs
6) generalizability of the model

Pilot period - January 2001 to September 2002

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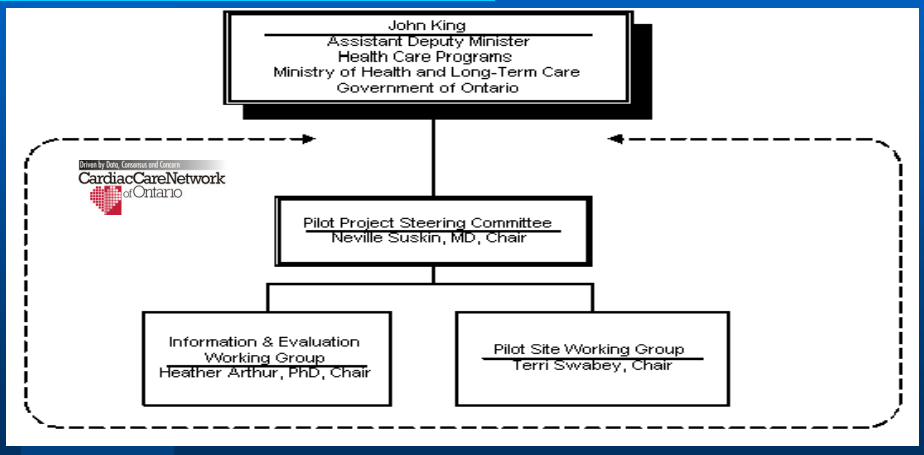
"The Pilot" - Organizational Chart



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Cardiac Rehabilitation Pilot Project Steering Committee

- **Chair** - Dr. Neville Suskin, London Health Sciences Centre
- Dr. Heather Arthur, McMaster University
- Dr. William Dafoe, University of Ottawa Heart Institute
- Ms. Lori Marshall, Thunder Bay Regional Hospital
- Ms. Judy Poupore, Hopital Regional de Sudbury Regional Hospital
- Dr. Joseph Ricci, Rouge Valley Health System, Cardiac Rehabilitation Network of Ontario
- Mr. Donald Sanderson, Alexandra Hospital
- Dr. Michael Sharratt, University of Waterloo
- Dr. James Stone, Canadian Association of Cardiac Rehabilitation
- Dr. Gaetan Tardif, Toronto Rehabilitation Institute

**** MOHLTC AND CCN representatives also participated

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CR Pilot Strategy

Inpatient	6 month Outpatient phase			
Identification of Patient	Evaluation	Prescribed Exercise	Modification of Risk Factors	Specification of Long-Term Goals
Smoking cessation and prevention of relapse Initial assessment of physical activity Outpatient referral	Medical history Assessment of risk factors Exercise stress test Vocational counseling	Aerobic training (high caloric or interval) Resistance training On-site or at-home exercise program	Education Nutritional counseling Exercise Medication	Physical Vocational Psychological Clinical

Ades, New England Journal of Medicine 345 p892 Sep2001

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Pilot Model of Care

- Referral within 2 yrs of cardiac event, related hospitalization or change in cardiac status
- 6 months of intervention
- Intake/exit assessment/ stress test
- Risk stratification
- Case management
- Regular progress assessments, discharge planning
- Comprehensive, multidisciplinary
- Supervised exercise visits 2x/week

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Pilot Model of Care (cont'd)

- Regional Coordination Model
  - Planning and Program Development
  - Quality Management
  - Research and Education
  - Outreach Activities
- 5 Regional Coordination Centres
- Regional Coordinators
- 7 Satellite Centres

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Implementation Methodology
• Committee organizational framework
• Communications systems
• Development of standardized data collection tool
• Centralized database training workshops, data dictionary
• Guidelines document
• Centralized provincial training workshop
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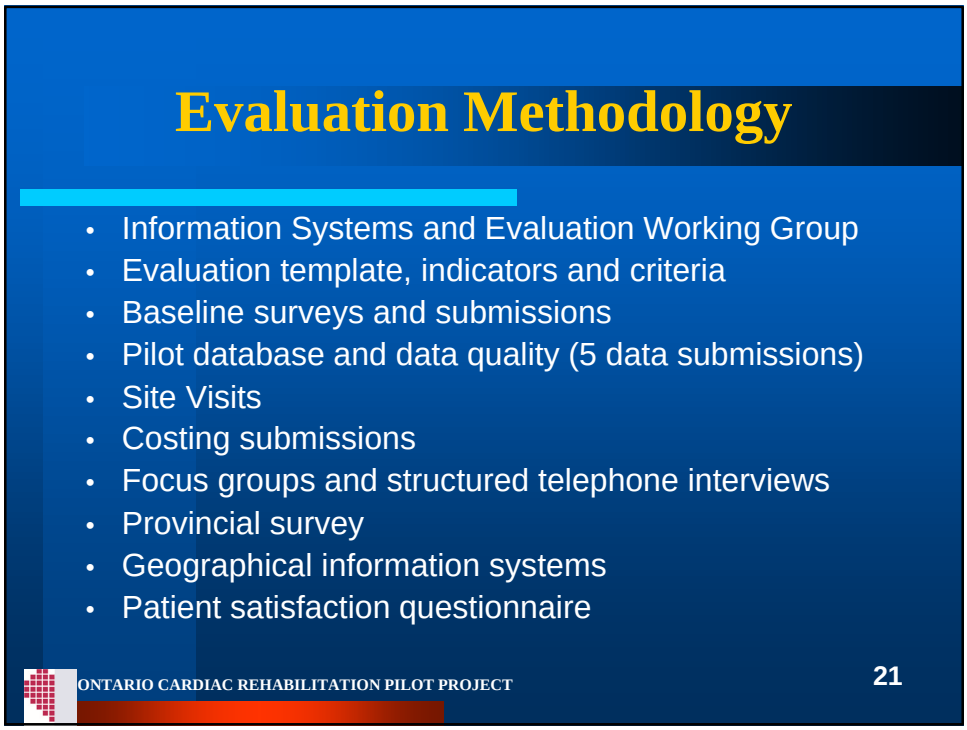
Evaluation Methodology
• Information Systems and Evaluation Working Group
• Evaluation template, indicators and criteria
• Baseline surveys and submissions
• Pilot database and data quality (5 data submissions)
• Site Visits
• Costing submissions
• Focus groups and structured telephone interviews
• Provincial survey
• Geographical information systems
• Patient satisfaction questionnaire
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Pilot Results: Demographics

- 26% female, 74% male
- mean age 61.2 yrs (range 21 to 91 yrs)
- females older than males: 64.1 vs. 61.8 yrs ($p<0.0001$)
- average participant caucasian (87.3%)
- majority lived with spouse/partner and not employed full-time

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Percentage of Patients Referred by Referral Event Type

Referral Event	Males		Females		All	
	N	%	N	%	N	%
CABG	1165	35.2%	265	22.7%	1430	31.9%
PTCA	724	21.9%	230	19.7%	954	21.3%
MI	578	17.4%	219	18.8%	797	17.8%
CAD	359	10.9%	164	14.1%	523	11.7%
Unstable Angina	215	6.5%	127	10.9%	342	7.6%
CHF	106	3.2%	56	4.8%	162	3.6%
Valve	75	2.3%	44	3.8%	119	2.7%
Cardiomyopathy	45	1.3%	34	2.9%	79	1.8%
Transplant	7	0.2%	2	0.2%	9	0.2%
Other	38	1.1%	24	2.1%	62	1.4%
All	3312	100.0%	1165	100.0%	4477	100.0%

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Pilot Results: Access

- Total Pilot patient enrollment: 4,922 (108% target)
- 60% increase in CR participation at Pilot sites
- 57% from new/satellite sites
- Total patients receiving CR at sites: 9,796 (pilot, non-pilot)
- 92% lived within a 30 minute drive time of centre

Intakes as a % of Cardiac Discharges in Pilot Catchment Areas

Ontario Planning Region	Pilot Catchment Area 2001 Cardiac Discharges	Pre-Pilot Total Patient Intakes		Pilot Total Patient Intakes	
		N	% Cardiac Discharges	N	% Cardiac Discharges
Central East	5,145	250	5%	410	8%
Central South	3,975	930	23%	1,116	28%
Central West	8,968	276	3%	1,448	16%
East	6,024	890	15%	1,292	21%
North	2,532	547	22%	1,104	44%
South West	6,391	800	13%	1,416	22%
Toronto	12,344	2444	21%	3,010	25%
Total	**45,377**	**6137**	**14%**	**9,796**	**22%**

Access to Under-served Populations

- 26% of Pilot patients female vs. 41% in eligible cardiac discharge population[1]
- Men were twice as likely as women to be represented at Pilot sites in patients >50 yrs. (p<0.0001)
- Visible minorities in Pilot 11.7% vs provincial rate of 17% (1996 Census data)
- Significant association between sex and visible minorities (p<0.01)

[1] CIHI discharge abstract database, 2000-01

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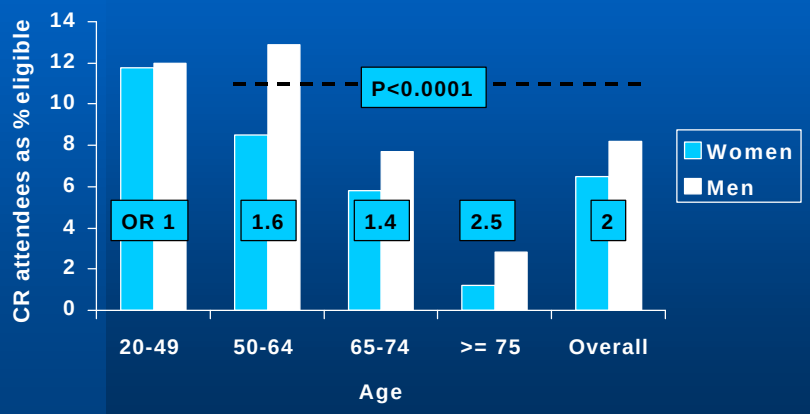
Access & Gender



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Referral Patterns - Location of Referral and Referral/Intake to CR

Location of Referral	% of Referrals	Mdn. Event to Referral (days)	Mdn. Event to Intake (days)
In-patient unit	29.8%	6	49
Cardiac Diagnostics	4.8%	42	48
Outpatient Clinic	7.6%	47	90
Physician's Office	56.6%	49	91
Unknown/other	1.2%		
Total	100%		

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Pilot Clinical Outcomes

- Significant improvements in both men and women's cardiovascular risk factors and quality of life
  - Significant improvement in values and the number of patients at target for: blood lipids, functional capacity, NYHA and CCS class, depression and anxiety scores, SF12 scores
- Significant closure of the 'care gap'
  - improvement in the number of patients taking known beneficial cardiac medications

[1] CIHI discharge abstract database, 2000-01

ONTARIO CARDIAC REHABILITATION PILOT PROJECT 27

Changes in Medication Use Versus Target

VARIABLE	Target	Intake	Discharge	P-value
Medications				
Anti-platelet agents	80%	86.4%	86.6%	0.7
Beta-blocker	80%	71.1%	68.9%	0.01
ACE-Inhibitor	80%	62.0%	66.9%	<0.0001
Statin	80%	72.8%	78.7%	<0.0001

Significant closure of the 'care gap' - improvement in the number of patients taking known beneficial cardiac medications

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Changes in Short- and Long-Term Risk Scores

1. ***CACR Long-Term Risk Score***

•65% more men and women classified as low-risk at Pilot exit

2. ***Duke Treadmill - short-term prognostic score***

•89% more women and 76% more men were categorized as low risk (<1% risk of cardiac event) at Pilot exit

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The Costs

Case Costs

- Pilot CR $1,500
- PCI $7,000 - $8,000
- CABG $10,000 - $20,000
- MI $8,000 - $11,000

- CR
  U$ 15,000 per yr life saved
- CABG
  U$ 14,000 per yr life saved

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Project Achievements - Access

- 60% increase in CR participation at Pilot sites
- Increased access from 14% to 22% of *all* eligible cardiac patients recently discharged from hospital in Pilot catchment - higher than rates reported in literature
- Increase in the number of sites across the province providing comprehensive and multidisciplinary CR services that are consistent with national and international best-practice guidelines

ONTARIO CARDIAC REHABILITATION PILOT PROJECT 37

Project Achievements - Clinical Outcomes

- Significant improvements in both men and women's cardiovascular risk factors and quality of life
- Improvements were consistent with, or better than, outcomes reported in the literature to date
- Significant closure of the 'care gap'

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Project Achievements -Clinical Outcomes

- Substantial reduction in risk of death or re-hospitalization with Pilot intervention
  - 65% more patients categorized at <1% annual risk of dying or hospitalization at Pilot exit vs. entry (5% risk at entry)
- Reduction of risk of re-hospitalization could yield health-care savings
- Patient satisfaction with the Pilot model was uniformly high

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Project Achievements - Service Delivery

- A standard, comprehensive model of CR can be rapidly implemented, despite geographic/practice pattern differences
- Standard electronic data collection tool at 24 sites
- Regional coordination was implemented throughout Ontario, including 7 new satellite sites
- Provincial/Regional coordination - standardization of:
  - care delivery & referral practices
  - clinical/educational tools for professional development and patient education.

Conclusion

- Cardiac rehabilitation can work
- Effective model can be implemented
- Recommended by National/International organizations
- Costs // benefits in perspective
- MOHLTC-CCN-Pilot Sites partnership

Recommendations

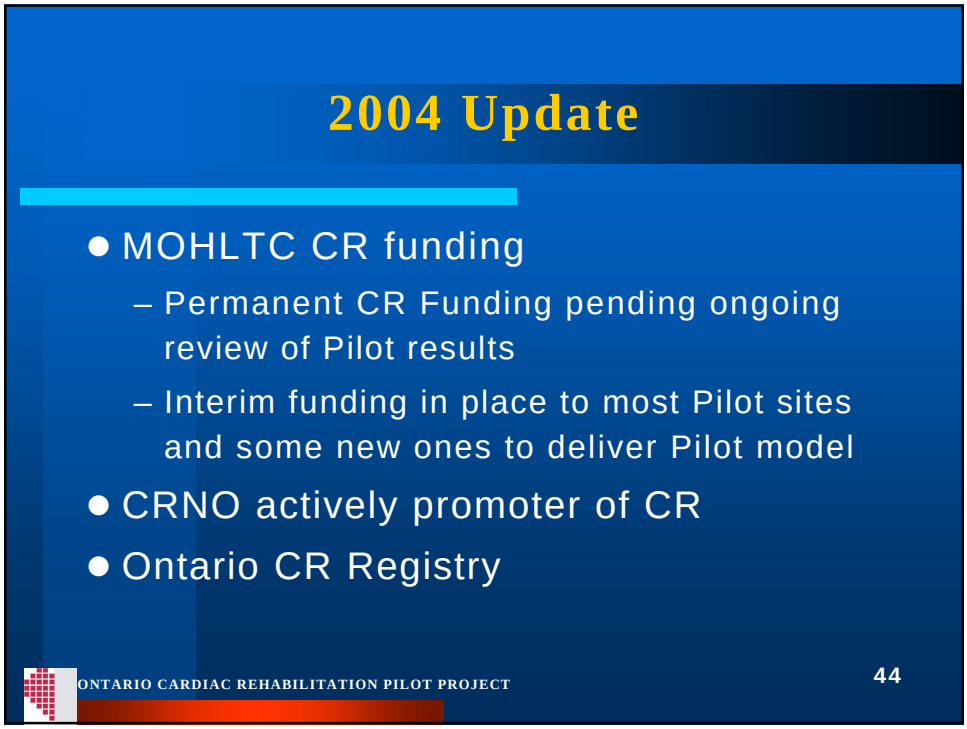
That the Ministry:

- Plan and deliver CR as part of integrated cardiac care services
- Implement CR in Ontario based on the Pilot model
- Maintain the level of funding for CR that was provided for the Pilot
- Aim to provide funding for an additional 5,000 CR patients annually for the next 5 years
- Adopt a regional coordination model for CR services

Recommendations (con't)

That the Ministry:

- Site CR programs based on the criteria recommended in the Pilot report
- Develop, use and monitor a comprehensive patient data registry at all CR sites
- Support a system for provincial coordination of CR services
- Support continued research of CR services


2004 Update
MOHLTC CR funding
– Permanent CR Funding pending ongoing review of Pilot results
– Interim funding in place to most Pilot sites and some new ones to deliver Pilot model
CRNO actively promoter of CR
Ontario CR Registry
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