

Monitoring for Metabolic Problems in Clients with Serious Mental Illness through the use of The Metabolic Health Monitor.

Elizabeth Budd RN, MA.

Barbara Trudell RN, BScN, CPMHNC

Tony Cohn MBChB, MSc, FRCPC

Centre for Addiction and Mental Health

Outline of Presentation

- ❖ Identifying metabolic risk factors in high risk populations e.g. client with severe mental illness
- ❖ The electronic Metabolic Health Monitor
- ❖ Implications for Nursing Practice – using the tool in interprofessional care planning

What influences Health in clients with serious mental illness

Medications

Lifestyle

Social Determinants



Illnesses

Family History

Metabolic Health Determinants

Social Factors

- Poverty
- Education

Lifestyle Factors

- Smoking
- Diet, exercise

HEALTH

Medication Factors

- Weight gain
- Diabetes/lipids
- Somnolence
- Cardiac effects

Patient/ Illness Factors

- Failure to recognize illness
- Direct effects of the illness on cardiac/autonomic/metabolic function
- Refusal and non-availability of adequate treatment
- Non-adherence with treatment

Systemic Factors

- Limited attention to medical care
- Separation of psychiatric and physical health care
- “Falling between the cracks”
- “Obesogenic Environment”

Links between health outcomes & social determinates

- **Economic inequality** individuals in higher social classes are healthier and live longer than those in lower social classes
- **Food security** 69% of those who access the Food Bank “worry” they won’t have enough to eat, 56% state they don’t have enough to eat (Toronto Food Bank 2007).
- **Stress** consider poor/inadequate (unsafe) housing, chronic levels of stress associated with lower social class

Links between health outcomes & social determinates (cont)

- **Education** interrupted, and possibly never completed
- **Poverty** research links poverty to poor health indicators (heart disease, diabetes, nutritional deficits, respiratory conditions, obesity, mental illness).
- **Social exclusion/Social support** lack of social support adversely impacts on mental health
- **Employment and job security** over 70% of persons with mental illness are unemployed (CMHA 2007)

Links between health outcomes & social determinates (cont)

World Health Organization (WHO) lists mental health issues as top causes of disability for both men and women worldwide, with poverty as one of the major contributors.

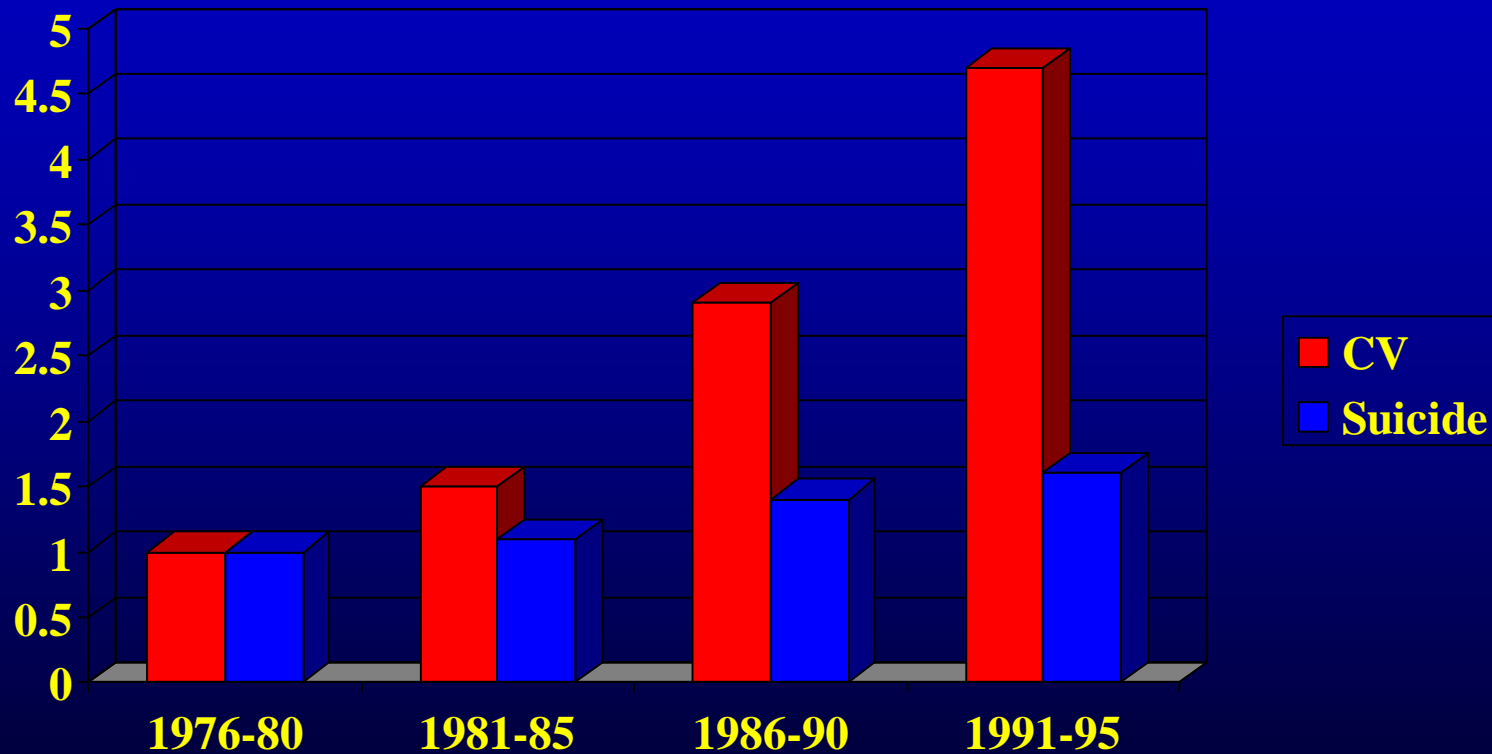
Mental illness can make it difficult to live above the poverty line – the chances of becoming poor are greater if someone is mentally ill.
Canadian Health Network 2004.

People with serious mental illness (SMI) have shorter lifespan & increased risk of death from medical causes

- Comparing mortality in public mental health clinics in the USA with the general population (1997-2000), patients lost an average 25yrs of life expectancy
- 60% of excess mortality in schizophrenia (in particular) is attributable to physical conditions (rates of suicide are also increased). Note: rates of Diabetes elevated in female clients with Schizophrenia who are treated on clozapine
- Rates of type 2 diabetes and obesity are increased two-three fold
- As in the general population the main cause of death is coronary heart disease (CHD), but to an even greater extent in this group

1. Harris EC, Br J Psychiatry 1998; 2. Colton CW, Prev Chronic Dis 2006;
3. Brown S, Br J Psychiatry 1997; 4. Hennekens CH, Am Heart J 2005

Risk of Cardiovascular Deaths versus Suicide in Male Schizophrenia Patients



Osby U, Br Med J. 2000

CONTRIBUTION OF MENTAL ILLNESS

- Increased prevalence of diabetes was reported in patients with schizophrenia and schizoaffective disorder prior to the use of psychotropic medications
- In Schizophrenia: Impaired glucose tolerance and insulin resistance has been reported in drug naïve patients

1. Kohen D, Brit J Psychiatry 2004; 2: Ryan M, Am J Psychiatry 2003; 3: Cohn T, Can J Psychiatry 2006;

Impact of medications on physical health

- **First generation Antipsychotic:**

Side effects: Extra pyramidal side-effects, Tardive Dyskinesia

- **Second Generation Antipsychotic:**

e.g. Clozapine Olanzapine Risperidone Seroquel
(New: Ziprasidone and Aripiprazole)

Side effects: Weight gain and associated medical complications e.g. Insulin resistance and consequent hyperinsulinemia is associated with 3 major related diseases Diabetes/Coronary Heart Disease/Hypertension - Metabolic Syndrome

Insulin Resistance – Sensitivity

Impact of Weight Gain – Link with Metabolic Syndrome

- Weight gain increases insulin resistance (double in obese individuals)
- Weight loss improves insulin sensitivity
- Obesity is the most clinically significant risk factor. Fat stored in the abdomen has more deleterious effect on insulin sensitivity.
- Sedentary individuals are more insulin resistant than active ones.

Metabolic Syndrome

Insulin resistance can result in Metabolic Syndrome: *hypertriglyceridemia, increased blood glucose, decreased levels of HDL, hypertension, obesity.*

Metabolic Syndrome is associated with heart disease.

Diagnosing Metabolic Syndrome.....

Metabolic Syndrome (Revised ATP III Criteria)

Operational criteria for diagnosing metabolic syndrome
= 3 of the following:

<i>Risk Factor</i>	<i>Level</i>
Abdominal Obesity (Waist circumference)	◆ Men: > 102 cms (40 in) ◆ Women: > 88 cms (35 in)
Hypertriglyceridemia	◆ Fasting triglycerides > 1.69 mmol/L
Low HDL Cholesterol	◆ Men: < 1.04 mmol/L ◆ Women: < 1.29 mmol/L
High blood pressure	◆ 130/85 or on antihypertensive medication
High fasting glucose	◆ ≥ 5.6 mmol/L

Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). Bethesda, Md, National Institute of Health, 2001

Grundy SM et al. *Circulation* 2005; 112(17):2735-52

What influences Health in clients with serious mental illness

Medications

Side effects

Lifestyle

(Poor diet)



Social Determinants

(Unemployment

Poverty)

Illnesses

(Schizophrenia)

Family History

(Diabetes, heart disease)

Managing Metabolic Problems in Serious Mental Illness

- Metabolic Monitoring for risk factors (Metabolic Health Monitor)
- Holistic Approach - Dietary and Activity Interventions (Mental Health and Metabolism Clinic)
- Attention to the Obesogenic Environment
- Promoting Primary Medical Care (role of experts – consultation and assessment)

Interventions: Individual Focus, Structured Group Systems/ Environmental Level Interventions

Metabolic Health Monitor

The Metabolic Health Monitor

- is used in by different CAMH clinicians in cooperation
- is part of our clients' electronic Health Record
- is easy to use and sends important info to the client's plan of care (ePPC)

*Help us keep camh clients safe.
Use the Metabolic Health Monitor!*

For more information, search "Metabolic"
on CAMH Insite,
or email metabolic@camh.net

Metabolic Monitoring

- An interprofessional approach to monitoring clients deemed at risk of developing Metabolic Syndrome
(Policy at CAMH to monitor all clients on SGAs)
- The electronic tool consists of a three page questionnaire that requires data on risk factors/medications/physical measurements/blood values.
- Once completed data is scored – risk factors or pre-risk factors are identified.
- Risks are identified in the clients electronic Care Plan, interventions to mediate the risk factors can be addressed.

Metabolic Health Monitor

Client Name:

MRN #

Encounter:



Metabolic - History

Assessment Information

Months since initial assessment

Months since last assessment

General Identifying Information

Age (yr)

Gender

Current Psychiatric Medication

Current Antipsychotic Medications



Any Current Antidepressant Medication



Any Current Mood Stabilizer Medication



Diabetes

Any Current Diabetes Medication



Metabolic Risk Factors

First Degree Relative With Diabetes



Metabolic Health Monitor

Client Name:

MRN #:

Encounter:



Metabolic - Measurements

Height (cm)	<input type="text"/>	(cm)
Weight (kg)	<input type="text"/>	(kg) <input type="button" value="Click To Enter Weight"/>
Waist Circumference (cm)	<input type="text"/>	(cm)
Systolic Blood Pressure (Sitting) (mmHg)	<input type="text"/>	(mmHg)
Diastolic Blood Pressure (Sitting) (mmHg)	<input type="text"/>	(mmHg)

All questions are mandatory.

Page 2 of 3



Save & Resume

Cancel



Metabolic Health Monitor

Client Name:

MRN #

Encounter:



Metabolic - Laboratory

Fasting Glucose (mmol/L)

(mmol/L)

Fasting Insulin (pmol/L)

(pmol/L)

Fasting insulin not measured at CAMH

Lab

Fasting Total Cholesterol (mmol/L)

(mmol/L)

Fasting Triglycerides (mmol/L)

(mmol/L)

Fasting HDL Cholesterol (mmol/L)

(mmol/L)

Fasting LDL Cholesterol (mmol/L)

(mmol/L)

**All questions are mandatory, except for
Random Urine Microalbumin, Fasting Insulin and Fasting LDL Cholesterol, if displayed.**

Page 3 of 3



Save & Resume

Cancel

Submit for Scoring

Tool: Metabolic (Metabolic Health Monitor)

Date: 04-Dec-2007

Entered into Computer by: Clinician

Type: Metabolic Assessment

Label:

Scoring

Interpretation

Raw Results

Access

Age (yr) 61.4

Gender Female

BMI * 37.6

Waist Circumference (cm) * 127

Diabetes? No

Pre-Diabetes? No

Metabolic Syndrome Yes

MS - Abdominal Obesity Yes

MS - Hypertriglyceridemia Yes

MS - Low HDL No

MS - High BP Yes

MS - Fasting Glucose No

Results Summary

Elizabeth Budd, CAMH
logged in

+ Client: [REDACTED]

MRN #: [REDACTED]



Printable Version

Tool: Metabolic (Metabolic Health Monitor)

Date: 04-Dec-2007

Entered into Computer by: Clinician

Type: Metabolic Assessment

Label:

Scoring

Interpretation

Raw Results

Access

[Edit](#)

Question	Answer
1. Current Antipsychotic Medications	quetiapine (Seroquel)
2. Any Current Antidepressant Medication	No
3. Current Antidepressant Medication	No
4. Any Current Mood Stabilizer Medication	Yes
5. Current Mood Stabilizer Medication	lithium carbonate (Carbolith/Lithane/Duralith)
6. Any Current Diabetes Medication	No
7. Current Diabetes Medication	No
8. Known Diabetes With No Medication Treatment	No
9. First Degree Relative With Diabetes	No
10. Personal History Of Gestational Diabetes	No

Scoring

BMI

Body Mass Index (BMI) is a measure of weight that takes into account height. BMI is commonly used to classify underweight, overweight, and obesity in adults and is defined as weight in kilograms divided by the measure of the height in metres (kg/m^2)

Normal Range:	18.5 - 24.9
Overweight:	≥ 25
Pre-Obese:	$25 \leq \text{BMI} < 30$
Obese:	≥ 30
Obese Class 1:	30 - 34.9
Obese Class 2:	35 - 39.9
Obese Class 3:	≥ 40

- References:
1. World Health Organisation (1995, 2000, 2004)
 2. Lau D et al. CMAJ 2007; 176: S1-13

Waist Circumference (cm)

Waist circumference is a measure of abdominal or central obesity, an indicator of coronary heart disease risk and a central feature of the metabolic syndrome.

MONTHLY WEIGHT SHEET

Client Name: MRN #: Encounter: 

Weight (kg) 

Tool: Weight Tool (Monthly/Visit Weight Tool)

Date: 05-Feb-2009

Entered into Computer by: Clinician

Type: Other

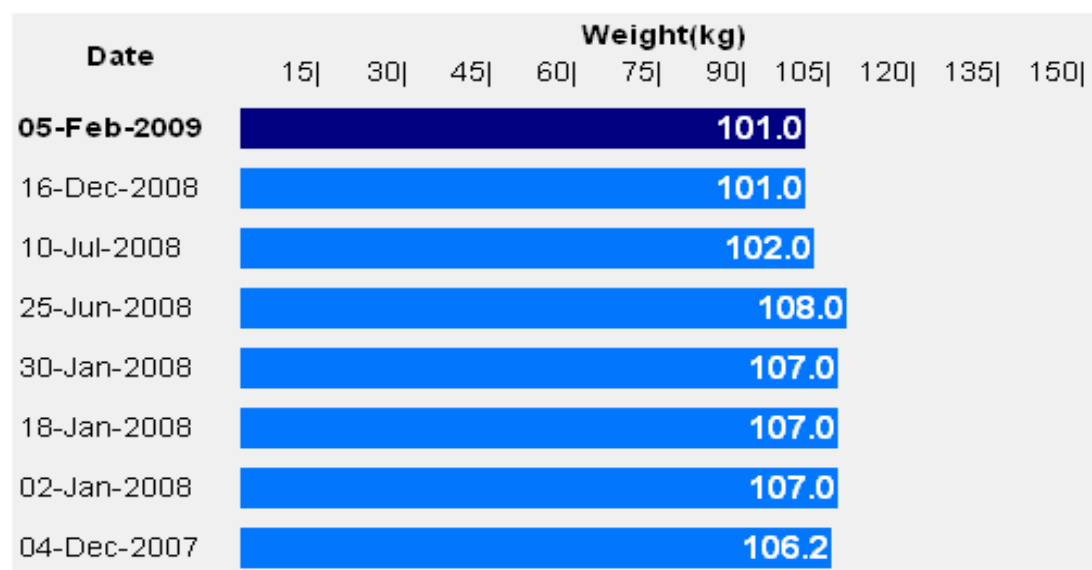
Label:

Scoring

Interpretation

Raw Results

Access



Designed by Hlnext

What the tool tells us.....

- As of June 2009 1071 individual clients have been monitored (mean age 41: range 16 to 93).
- Risk factors identified:

Pre-diabetic 12%, Diabetic 13%

Metabolic Syndrome 38%

Implications for Nursing Practice

The Metabolic Health Monitor in
interprofessional care planning

Psychiatric Mental Health Nurses

- Are in an ideal position to identify, refer and monitor treatment of comorbidities.
- Are key members of the health care team whose **holistic framework** can afford an **opportunity to bridge the gap between mental and physical health**

1 McDevitt J. J Psychosoc Nurs Ment Health Serv. 2004

2 Vreeland B. J Am Psychiatr Nurses Assoc. 2004

Through a Late Career Project, Nursing Student Placements and a Diabetes Educator Course

- Literature review
- Surveyed clients and staff about knowledge and needs related to a healthy lifestyle and metabolic complications

Results:

- ✓ Clients wanted information and opportunities to use what they learned
- ✓ Staff felt constrained by time pressures and a lack of current information

Literature Review

- Self-management learned through education programs is one of the most effective ways for individuals to acquire the knowledge and skill needed to make necessary and behavioural changes and apply them in daily life
- Self-management is in keeping with the Recovery Model and it's concepts of client-centeredness, empowerment and self-determination

1 Mueser KT. Psych Serv, 2002

2 Clark C CAMH 2007

Literature Review (cont)

- A Chronic Care Model and Case Management is recommended as a method of improving care, it is team-based and coordinated between specialties
- Clinicians act as case managers, educators and consultants

Literature Review (cont)

- People with schizophrenia obtain benefit from education
- Challenges are related to cognitive impairment and inability to manage self-care programs: e.g negotiating appointments, referrals and follow up, confusion over competing care instructions, potent drug interactions and social difficulties

1 Dickerson FB. Psychosomatics. 2005 2 Littrell KH. L of Nurs Scholarship 2003

3 Chiverton PA. J Psychosoc Nurs and MH 4 Warren BH. Dis Mngmnt & MHS 2001

Literature Review (cont)

Education is more successful when:

- A variety of educational and behavioural techniques are used along with community support.
- It is interactive, solution-focused and based on the experience of the learner, staged and tailored to meet individual needs and abilities.
- Knowledge is enhanced and positive outcomes maximized with group work and long-term follow up using specific behaviour change strategies and the reinforcement of learned behaviours.

1 CDA Diabetes Educator Section 2003

Literature Review

One study recommended strategies such as:

- instruction in specific and narrowly defined skills
- breaking material into smaller units
- aids to reduce requirements of memory and attention
- Frequent repetition
- Opportunities for behavioural rehearsal
- Dickerson, FB Psychosomatics 2005

Literature Review (cont)

Components of a “Well-Being” Support Program

- General Health: BP/BMI/thyroid function/serum prolactin/ blood glucose/lipid/cholesterol levels (Metabolic Health Monitor)
- Lifestyle: smoking cessation/diet/physical activity/substance abuse (Programs and Care Planning)

1 Department of Health U.K. 2006

2 Canadian Diabetes Assoc Clinical Practice Guidelines 2008

3 Chiverton PA J Psychosoc Nurs Ment Health Serv 2007

Archway Community Outpatient Clinic Toronto

Bridging the Gap

Program is Community- based, located in the Parkdale area of downtown Toronto. Client profile: 350 patients diagnosed with schizophrenia (most on disability, living in boarding homes, subsidized or supportive housing).

- Program Provides: Case Management services, programming includes promoting Healthy Lifestyle changes.
- Interprofessional Team – develops Interdisciplinary Plans of Patient Care (eIPPC). Team includes: OT, SWs, Psychiatrists, RT, RNs, RPNs, Case Workers, Students & CAMH resources.

Arts & Crafts
RT

Health & Metabolism
Primary Care Clinic
Foot Care

Outings
Summer & Winter
Camping
RT, Nurse

Walking Groups
Beginners
Advanced
RT&Nurse

Healthy Cooking
Healthy Baking
RT, Nurse, OT

CLIENT

Dance Group
Nurse

Smoking
Cessation
Nurse

Health
Teaching
Diabetes
Nurse

Concurrent
Disorders
Group
Nurse

Yoga
AT
Relaxation
Group
Nurse

YMCA Group
Memberships
RT

The Metabolic Monitoring Tool and the Interprofessional Approach to Care Planning

Metabolic Monitoring Goals

- Identify treatable medical conditions (Diabetes, Dyslipidemia, Hypertension) and risk markers (Pre-Diabetes, Metabolic Syndrome, Obesity). Provide follow-up.
- Collaborate with the client to make healthy lifestyle changes through education.
- Provide opportunities (programs), consult with experts: refer client to Mental Health and Metabolism Clinic, Diabetic Clinic etc.

[Empty box]



NURSE

- Weigh & measure Client. Take BP & P.
- Determine BMI. Share findings with Client.
- Document on Metabolic Monitoring Protocol Form

based on risk, consultation with Circle of Care Providers & continued attempts at designated intervals to involve Client.

- Document in Progress Notes & IPCC



NURSE & CASE MANAGER

- Assist Client to obtain lab work & ECG
- Document plan in Progress Notes

Results Normal

- Fax results to GP
- No action necessary
- Document
- Continue to follow Monitoring Protocol



PSYCHIATRIST

- Reviews lab & ECG results
- Meets with Client to discuss results & recommendations.
- Discusses findings and develops IPCC in consultation with Client, Case Manager.

*** RESULTS ABNORMAL PSYCHIATRIST & CASE MANAGER**

- Fax results to GP
- Refer to specific professionals for treatment, Archway program activities & follow up
- Continue to follow metabolic monitoring protocol



Tool: Metabolic (Metabolic Health Monitor)

Date: 04-Dec-2007

Entered into Computer by: Clinician

Type: Metabolic Assessment

Label:

Scoring

Interpretation

Raw Results

Access

Age (yr)	61.4
Gender	Female
BMI *	37.6
Waist Circumference (cm) *	127
Diabetes?	No
Pre-Diabetes?	No
Metabolic Syndrome	Yes
MS - Abdominal Obesity	Yes
MS - Hypertriglyceridemia	Yes
MS - Low HDL	No
MS - High BP	Yes
MS - Fasting Glucose	No

Homa Beta Cell	**
----------------	----

Framingham 10-Yr CHD Risk

FR - Age Points	4
FR - HDL Points	2
FR - Diabetes Points	4
FR - Smoker Points	0
FR - Total Cholesterol Points	0
FR - Blood Pressure Points	2
FR - Total Points	4
FR - 10-Yr Risk Calculation *	4%

Lipids

Target LDL	< 2.0 mmol/L
Actual LDL *	3.12
Target TC:HDL	< 4.0
Actual TC:HDL *	4.44
Fasting Total Cholesterol (mmol/L) *	4.80
Fasting Triglycerides (mmol/L) *	1.32
Fasting HDL Cholesterol (mmol/L) *	1.08

Blood Pressure

Systolic Blood Pressure (Sitting) (mmHg) *	126
Diastolic Blood Pressure (Sitting) (mmHg) *	93

* : scale has risk cut-offs

** : scale could not be calculated due to missing values

<input type="checkbox"/>	Issues / Needs Title	Domain	Goals	Goal Status	Last Modified By	Last Modified	Time Limited	Client Goal Priority	Clinician Goal Priority
<input type="checkbox"/>	Client has Hyperlipidemia	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	High Blood Pressure	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	Clinical Obesity	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	High CHD Risk	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	Metabolic Syndrome	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	Diabetes	Metabolic Health (MH)		Auto-Updated		25-Aug-2009 4:11 PM			
<input type="checkbox"/>	Decisional Integrity	Mental Health / Addictions / Medical (MHA)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Discharge Resources	Community Supports (CS)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Psychotropic Drug Review	Mental Health / Addictions / Medical (MHA)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Adherence	Mental Health / Addictions / Medical (MHA)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Economic Status	Employment (Emp)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Support Systems - A) Social Supports	Communication / Therapeutic Relationships (CTR)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			
<input type="checkbox"/>	Support Systems - A) Social Supports	Family / Parenting Relationships (FPR)		Auto-Updated	RAI-MH	5-Jun-2009 9:56 AM			

- Domain:***
- Mental Health / Addictions / Medical (MHA)
 - Housing (Hou)
 - Education (Edu)
 - General Health / Lifestyles (GHL)
 - Legal Issues / Status (LIS)
 - Communication / Therapeutic Relationships (CTR)
 - Finances (Fin)
 - Social Networks (SN)
 - Leisure (Lei)
 - Metabolic Health (MH)
 - Safety (Saf)
 - Employment (Emp)
 - Family / Parenting Relationships (FPR)
 - Community Supports (CS)

Issues/Needs Title:*

Issues/Needs Details:

Goals:**

Status:*

Client Priority:

Clinician Priority:**

Strengths / Resources

Challenges

Spell Check

* fields are mandatory.

Summary

- Identify clients at risk
- Use of CAMH tools to identify, monitor and track physical risks (Metabolic Tools)
- Integrate inter-professional Best Practices into care provision (eIPCC)
- Actively promoting client involvement in their care (Recovery and Self Management Practices)