



DISEASE SCREENING IN THE COMMUNITY

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Disclosure

- The author and presenter of this program have declared that they have no conflict of interest to disclose.

Learning Objectives

After successful completion of this workshop, pharmacists will be better able to:

1. Discuss various opportunities for conducting disease screening in the community
2. Advocate for screening and reimbursement in the community pharmacy setting
3. Assess the business potential from disease screening programs through consideration of costs and potential revenues

Screening Defined

“Screening is a public health service in which members of a defined population, who do not necessarily perceive they are at risk of, or are already affected by, a disease or its complications, are asked a question or offered a test, to identify those individuals who are more likely to be helped than harmed by further tests or treatment to reduce the risk of a disease or its complications.”¹

Why Screen in the Pharmacy?

Public Health Perspective

- Accessibility
 - Hours of operation
 - Geographical locations
 - No appointment necessary
- Knowledgeable health professionals
 - Excellent resource for recommendations (e.g., lifestyle changes)
- Relationships with general community
 - Well respected
- Real-time provision of health information and lifestyle recommendations

Why Screen in the Pharmacy?

Pharmacy Business Perspective

- Increased pharmacy traffic
- Increased professional profile of pharmacy in community
- Potential for enhanced relationship with healthcare professional prescribers in the community
- Business opportunities associated with:
 - Screening
 - Sales associated with screening result recommendations (e.g., lifestyle change programs, products)
 - Incidental sales
 - Participation of patient in additional professional programs (e.g., Medication Review)

Opportunities for Screening and Risk Assessment

- Cardiovascular Risk Assessment (e.g., 10-year FRS)
 - Dyslipidemia
 - Skin cholesterol testing
- Blood pressure
- COPD
- Osteoporosis
- Diabetes and prediabetes
- Obesity management
- Skin damage
- Colorectal cancer

CARDIOVASCULAR RISK ASSESSMENT

CV Risk Assessment

- 10-year Framingham Risk Score (total CV disease)
 - Requires age, gender, TC, HDL, smoking status, systolic BP reading, diabetes status
- CV Age (for younger individuals)
 - Requires TC, HDL, smoking status, systolic/diastolic BP reading, diabetes status
- Skin cholesterol testing
- Ideal for pharmacy clinics
- No fasting required for TC, HDL measurements
 - Point-of-care lipid assessment required
- Clinic consists of lipid assessment followed by patient consultation based on risk factors discussion

CV Risk Assessment

1. We recommend that a **cardiovascular risk assessment** using the “10 Year Risk” provided by the **Framingham** model be completed every 3 to 5 years for men age 40 to 75, and women age 50 to 75. This should be modified (percent risk doubled) when **family history** of premature CVD is positive (i.e., 1⁰ relative <55 years for men; <65 years for women). A risk assessment may also be completed whenever a patient’s expected risk status changes. Younger individuals with ≥ 1 risk factor for premature CVD may also benefit from a risk assessment to motivate them to improve their lifestyle.

(Strong Recommendation, Moderate-Quality Evidence)

CV Risk Assessment

2. We recommend calculating and discussing a patient's **“Cardiovascular Age”** to improve the likelihood that patients will reach lipid targets and that poorly controlled hypertension will be treated.
(Strong Recommendation, High-Quality Evidence)

Values and preferences:

The primary evaluation of risk is the modified 10-year Framingham Risk Score (FRS). Given the overlap in risk factors for diabetes, a simultaneous evaluation of cardiometabolic risk for diabetes may be useful to motivate lifestyle changes. It is well known that a 10-year risk does not fully account for risk in younger individual. In these individuals, the calculation of a Cardiovascular Age has been shown to motivate subjects to achieve risk factor targets.

Case: Jim Gets Motivated

Jim is a 32-year-old accountant who used to be in good shape when he was in university. He was quite active and ate well until settling into an accountant position post-graduation. Unfortunately, all of the deskwork and client lunches caught up with Jim, and he is now obese. Jim also started smoking in his early 20s, and he has tried to quit on 3 occasions over the past 5 years, but without success. When a 40-year-old friend recently had a heart attack, it gave him a “wake-up” call, and now he is in your pharmacy at the Heart Health Risk Assessment Clinic.

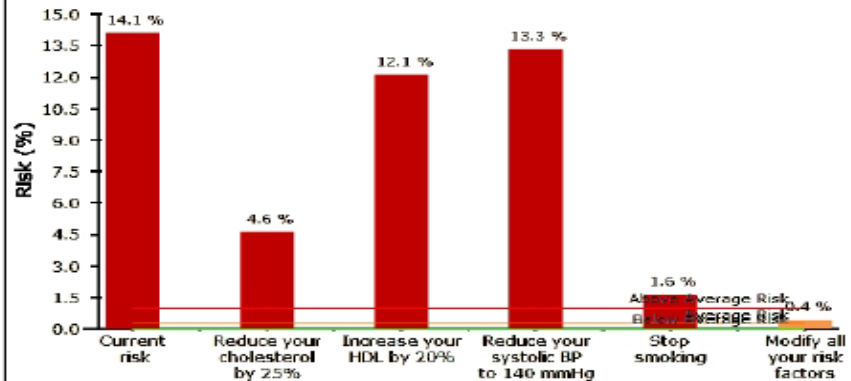
Jim tells you that he has not seen his doctor for a couple of years. You find that Jim has a total cholesterol of 7.2 mmol/L and an HDL cholesterol of 1.1 mmol/L.

Name: _____ **Age:** 32 years
Consultation date: 2012-11-07 **Height:** 6 feet 0 inches
Gender: Male **Ideal weight:** 137 - 185 pounds

CVD present	No
Family History of CVD	No
Blood Cholesterol (mmol/L)	
Total Cholesterol	7.2
LDL Cholesterol	4.3
HDL Cholesterol	1.1
Total-HDL Ratio	6.55
Blood Pressure (mmHg)	
Systolic	147
Diastolic	95
BP Medication	No
Smoker	Yes
Diabetes	No
Weight (lbs)	245
Body Mass Index (kg/m ²)	33.2
Waist Circumference (in)	41

Cardiovascular Age 42.1

10-year Cardiovascular Disease Risk



You have 4 modifiable cardiovascular risk factors: total cholesterol, HDL-cholesterol, blood pressure and smoking.

- Reduce your total cholesterol by 25% (LDL-cholesterol by 35%) and lower your risk to 4.6%
- Increase your HDL-cholesterol by 20% and lower your risk to 12.1%
- Reduce your systolic blood pressure to 140 mmHg and lower your risk to 13.3%
- Quit smoking and lower your risk to 1.6%

By reducing your total cholesterol by 25% (LDL-cholesterol by 35%), increasing your HDL cholesterol by 20%, reducing your systolic blood pressure to 140 mmHg and quitting smoking, you can lower your 10-year cardiovascular risk to 0.4%. You can also lower your cardiovascular age to 33 years.

These results represent average risks based on the information provided.

The actual experience of individual patients will vary.

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**Jim's 10-
 Year CV Disease
 Risk**

Developing Jim's Action Plan

Jim appears very motivated to quit smoking and to reduce his weight and fat intake after viewing his CV risk assessment results. You suggest that he may want to participate in your pharmacy's Quit Smoking program, which utilizes smoking cessation counselling along with smoking cessation aids that are deemed to be most appropriate for the patient. You go on to speak with Jim about healthy nutrition in general, and ideas that could help him to become more active.

Opportunities in CV Risk Assessment

- Payment for CV Risk Assessment
- Smoking cessation
- Medication reviews
- Nutrition tips and nutrition classes
- Weight management program and coaching
- Scales, blood pressure monitors

**Should we charge for this
professional service?**

BLOOD PRESSURE SCREENING

Blood Pressure Screening

- In virtually every pharmacy
 - Are we taking advantage?
 - How is proper use ensured?
 - Are people with abnormal readings identified and counselled?
 - How could we accomplish this?
- Opportunities
 - Lifestyle issues discussion
 - Appropriate home BP monitor
 - Nutrition counselling
 - Physical activity counselling
 - Weight management counselling
 - Adherence discussion (blister packaging)
 - Medication reviews
 - Community forums

Case: Margaret Drops By

Margaret is a 71-year-old woman who takes hydrochlorothiazide 25 mg once daily for blood pressure. She has been on the same dose of medication for a number of years and has her pressure checked at her semi-annual doctor's check-up. At her last visit to the doctor, her pressure was 145/95 mm Hg. She told the doctor she had been running around doing errands before her appointment and probably had gotten herself worked up. The doctor asked Margaret if she owned a blood pressure monitoring device. When Margaret shook her head "no," her doctor said that she should consider speaking with her pharmacist about a blood pressure monitoring device that she could use at home.

Blood Pressure Measurement Devices

- As “Recommended by Hypertension Canada”
 - Devices with memory or printout for storing readings
 - Patient to review with health professionals



- Requirements for Endorsement
 - Validation articles published in medical journals that have been peer-reviewed
 - Protocols used to prove accuracy of the device (e.g., British Hypertension Society, International Protocol, AAMI protocol)

List of endorsed devices available online at

<https://www.hypertension.ca/en/devices-endorsed-by-hypertension-canada>

- Critical for Pharmacy Team to promote and demonstrate devices appropriately

BpTRU™

- Takes up to 6 blood pressure readings, discards the first reading, and provides an average of the remaining readings



- *“The single measurement to define a patient’s blood pressure would over diagnose hypertension in 20-30% of the world and miss a third who are truly hypertensive.”*

MCALISTER, FA ET AL, BMJ 2001;322;908-911

BP Monitoring Guidelines

- The use of home BP monitoring on a regular basis should be considered for patients with hypertension, particularly those with:
 - diabetes mellitus
 - chronic kidney disease
 - suspected nonadherence
 - demonstrated white coat effect and
 - BP controlled in the office but not at home (masked hypertension)
- Home SBP values ≥ 135 mm Hg or DBP values ≥ 85 mm Hg should be considered elevated and associated with an increased overall mortality risk analogous to office SBP readings of ≥ 140 mm Hg or DBP ≥ 90 mm Hg

Quality Control

- Healthcare professionals should ensure that patients who measure their BP at home have adequate training and, if necessary, repeat training in measuring their BP. Patients should be observed to determine that they measure BP correctly, and they should be given adequate information about interpreting these readings.
- The accuracy of all individual patients' validated devices (including electronic devices) must be regularly checked against a device of known calibration.
- Home BP values for assessing white coat hypertension or sustained hypertension should be based on duplicate measures, morning and evening, for an initial seven-day period. First day home BP values should not be considered.

Margaret Is More Relaxed

While attending her next medical check-up, Margaret tells her doctor that the staff at the pharmacy was very helpful. Her blood pressure is averaging 128/82 mm Hg, and she is not worried about it anymore.

Advantages of Blood Pressure Measurement Promotion

- Increased patient interaction and hypertension education
- Increased pharmacy traffic
 - Potential for incidental sales
 - Potential for heart health-based sales targeted to client
- Increased professional credibility
- “Show off” pharmacy and staff
- Not being “left behind”

COPD SCREENING

Early Identification of COPD Is Critical!

- COPD is preventable and treatable
- The early stages of COPD are often unrecognized by the patient
 - Indolent process
 - Smokers often ignore early symptoms such as cough and sputum
 - Evolves slowly
 - When smokers present to their physicians because of shortness of breath, they typically have well established airflow obstruction
- Document smoking status of all patients
- Intervene appropriately

Assessment of COPD

1. Do you cough regularly?
2. Do you cough up phlegm regularly?
3. Do even simple chores make you short of breath?
4. Do you wheeze when you exert yourself or at night?
5. Do you get frequent colds that persist longer than those of other people you know?

If age \geq 40 yrs. and patient is smoker or ex-smoker and responds yes to any of the listed questions, then referrals should be made for further assessment, including spirometry.

Lung Function Assessment

Spirometry – A Review

- **Forced Vital Capacity (FVC)** – the total volume of air exhaled from the lungs after maximal inspiration and maximal forced expiration
- **Forced expiratory volume in one second (FEV₁)** – the volume of air exhaled in the first second under force after a maximal inhalation.
- **FEV₁/FVC ratio** – The percentage of the FVC expired in one second. An FEV₁/FVC ratio of less than 0.7 after bronchodilator administration is required for a diagnosis of COPD.
- **FEF25-75%** – Forced expiratory flow over the middle one-half of the FVC; the average flow from the point at which 25% of the FVC has been exhaled to the point at which 75% of the FVC has been exhaled.

Lung Age

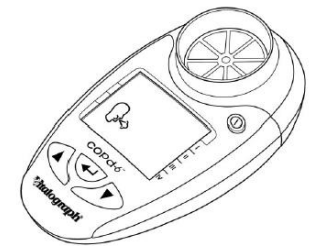
- Age of the average person with FEV_1 the same as that of individual being tested
- Makes spirometry data easier to understand
- Tool is potentially motivation for people who want to quit smoking

Ralph Wants to Quit

Ralph is a 52-year-old construction worker who has smoked an average of a pack of cigarettes daily since he was 17 years old. He takes medications for blood pressure and hyperlipidemia control. He has just walked into your pharmacy and tells you that he has heard you are running a clinic to “test people’s breathing.” You concur that you are running a screening clinic to help people understand how their breathing is compared to other individuals their own age. Ralph tells you that he would like to participate.

copd-6™ Lung Age Device

- Small, portable device provides FEV₁ and FEV₁/FEV₆ results
 - FEV₁ and FEV₁ % predicted
 - FEV₆ and FEV₆ % predicted
 - FEV₁/FEV₆ and FEV₁/FEV₆% predicted
- Screening for people who may require further assessment with spirometry



Ralph Is in the “Preparation Phase”

Ralph is shocked to hear that his lung age is 65 years, even though he is only 52 years old. He really wants to do something about this! Ralph tells you that he is ready to listen to you with respect to quit smoking strategies, because he has not been able to quit on his own in the past. He has tried various forms of nicotine replacement therapy but hasn't done well with any of them. His friend quit for good with a little pill that he took twice a day.

COPD Screening Opportunities

- Identify patients day to day as per CTS assessment criteria
- Fee for clinics to identify individuals who may potentially have COPD
- Medication reviews (e.g., MedsCheck)
- Identify patients eligible for immunization
- Smoking cessation intervention program
- Smoking cessation aids (e.g., NRT or prescription for varenicline or bupropion)
- Returning prescription client
- Others?

OSTEOPOROSIS SCREENING

Osteoporosis Risk Assessment Clinic

- Osteoporosis often goes undetected until fractures occur
 - ~ 1/3 of individuals with osteoporosis have been diagnosed
- Help patients understand osteoporosis risk

Assessment based on:

- Ultrasound Bone Sonometer
 - Measurement of bone structure quality
- Risk factors according to Canadian Osteoporosis Guidelines
- Osteoporosis Canada Clinical Tools at <http://www.osteoporosis.ca/multimedia/tools.html>

Risk Factors for Fracture

- Age \geq 65
- Vertebral compression fracture
- Fracture with minimal trauma after age 40
- Family history of osteoporotic fracture (especially parental hip fracture)
- Tendency to fall
- Spinal fracture apparent on x-ray
- Hypogonadism (low testosterone in men, loss of menstrual periods in younger women)
- Early menopause (before age 45)
- Low body weight (< 60 kg)
- Major weight loss (> 10% body weight at age 25)
- Low calcium intake
- Excess alcohol (consistently > 2 drinks/day)
- Smoking
- Low bone mineral density
- Corticosteroid use
- Rheumatoid arthritis


The FRAX[®] Tool

- WHO Fracture Risk Assessment Tool
- Validated for various countries around the world
- Available as an electronic tool, online (Canada) at <http://www.sheffield.ac.uk/FRAX/tool.jsp?country=19>
- Will calculate fracture risk using BMI if BMD not available

Meet Joan

Joan is a 55-year-old woman who is excited about just becoming a grandmother for the first time. Joan is just about to retire from her position as a financial advisor at a local bank, where she spends much of her day sitting. She has heard about the osteoporosis risk assessment clinic being held at your pharmacy and decides to make an appointment. Joan is quite intrigued by the technology involved in assessing risk. You help her to better understand the process and also the benefits of a medication review.

Joan's FRAX Results

Country: Canada Name/ID: Joan Smith About the risk factors 

Questionnaire:

1. Age (between 40-90 years) or Date of birth
Age: Date of birth: Y: M: D:

2. Sex Male Female

3. Weight (kg)

4. Height (cm)

5. Previous fracture No Yes

6. Parent fractured hip No Yes

7. Current smoking No Yes


8. Glucocorticoids No Yes

9. Rheumatoid arthritis No Yes

10. Secondary osteoporosis No Yes

11. Alcohol 3 or more units per day No Yes

12. Femoral neck BMD (g/cm²)
Select DXA

BMI 23.0 
The ten year probability of fracture (%)

■ Major osteoporotic	4.6
■ Hip fracture	0.4

Ultrasound Bone Sonometer Results

Joan is happy with her results as determined by FRAX, but she is quite intrigued by the ultrasound bone sonometer, which she perceives is a more direct measure of her bone quality. Upon completion of the test, the results do correlate well with the results from the FRAX assessment.

Joan's Ultrasound Bone Sonometer Results

Measurement Report

Patient Information

First Name.....Joan
 Family Name.....Smith
 Age.....55y1m
 Height.....5'5"
 Weight.....136.0 Lb
 BMI.....23

ID.....122-12-1234
 Gender.....Female
 Menopausal age.....52
 Referring Physician.....Dr. Robinson
 Reporting Physician.....Dr. Costner
 Operator.....Lynn Moore

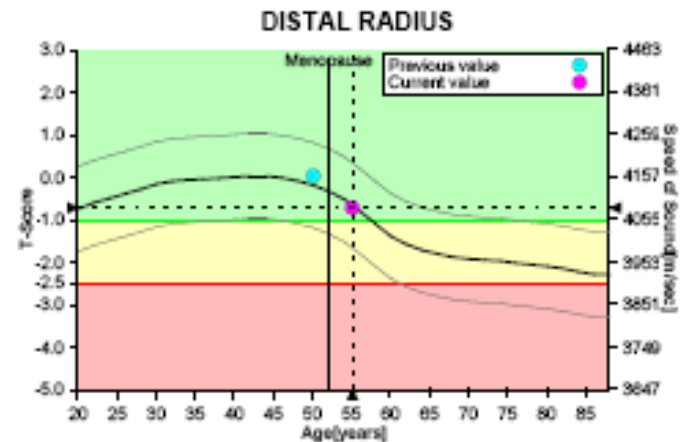
Measurement Results

Site.....DISTAL RADIUS

SOS.....4081[m/sec]
 Speed of Sound

T-Score.....-0.7
 Number of standard deviations from the mean of healthy young adults

Z-Score.....0.0
 Number of standard deviations from the mean of age matched population



Findings and Comments

- Bone strength is within the normal range.
- Bone strength is low; Medical attention is recommended.
- Bone strength shows deterioration; Medical attention is recommended.

Signature _____

Opportunities in Osteoporosis Risk Assessment

- Fee for osteoporosis risk assessment
- Calcium, vitamin D, etc.
- Medication review
- Nutrition and physical activity counselling and programs
- Identification of patients with osteoporosis may lead to referrals and long-term pharmacotherapy
- Professional service increases likelihood of returning clients

DIABETES AND PREDIABETES SCREENING

The Diabetes Epidemic¹

- Incidence increasing at alarming rate
- > 3 million Canadians living with diabetes
 - Expected to reach 3.7 million by 2020
- ~ 6 million Canadians with prediabetes
 - ~50% progress to type 2 diabetes in their lifetime
- Contributes to deaths of ~ 41,500 Canadians/yr.
 - Twice as likely to die prematurely
 - 80% die as result of MI or stroke

Why is type 2 diabetes prevalence increasing so quickly?¹

- Aging population
- Obesity rates rising
- Increasingly sedentary lifestyle
- Aboriginal people 3-5 times more likely to develop type 2 diabetes
- ~ 80% of new Canadians are from populations at higher risk (e.g., Aboriginal, Hispanic, Asian, South Asian, African descent)

Who is at high risk for type 2 diabetes?

- Individuals \geq 40 years
- First-degree relative with type 2 diabetes
- Member of high-risk population:
 - e.g., Aboriginal, Hispanic, South Asian, Asian, or African descent
- History of prediabetes (IGT, IFG or A1C 6.0% - 6.4%)
- History of gestational diabetes mellitus
- History of delivery of a macrosomic infant (e.g., over 4.1 kg)
- Presence of end organ damage associated with diabetes:
 - Microvascular (retinopathy, neuropathy, nephropathy)
 - Macrovascular (coronary, cerebrovascular, peripheral)
- Presence of vascular risk factors:
 - HDL cholesterol level $<$ 1.0 mmol/L in males, $<$ 1.3 mmol/L in females
 - Triglycerides \geq 1.7 mmol/L
 - Hypertension
 - Overweight
 - Abdominal obesity
- Presence of associated diseases:
 - Polycystic ovary syndrome
 - Acanthosis nigricans
 - Psychiatric Disorders (bipolar disorder, depression, schizophrenia)
 - HIV infection
 - Obstructive sleep apnea
- Use of drugs associated with diabetes:
 - E.g., glucocorticoids, atypical antipsychotics, highly-active antiretroviral therapy (HAART)

Recommendations from CDA

- A structured program of lifestyle modification that includes moderate weight loss and regular physical activity should be implemented to reduce the risk of type 2 diabetes in individuals with IGT and IFG and A1C 6.0%–6.4%.
- In individuals with IGT, pharmacological therapy with metformin or acarbose may be used to reduce the risk of type 2 diabetes.

Options for Prediabetes and Diabetes Screening

- Fasting plasma glucose
 - Fasting and blood draw required, low sensitivity
- Hemoglobin A1C
 - More sensitive than FPG, no fasting, blood draw required
- CANRISK questionnaire
 - More sensitive than FPG, no fasting or blood draw required
 - Results stated as low, moderate, high, or very high risk
- Non-invasive diabetes testing using detection of advanced glycation endproducts (AGEs) in skin via fluorescence spectroscopy
 - No blood draw or fasting (opportunistic)
 - More sensitive, less specific than other tests

Diabetes Screening Recommendations 2012

- Screening adults at high or very high risk is expected to reduce rates of MI, microvascular complications & mortality
- 2-stage screening, starting with **a validated risk calculator**, is recommended to identify people at high or very high risk of diabetes
- Validated risk calculators can be used to select patients for screening and may inform them about their risk factors
- Annual screening for very high risk individuals and 3-5 years for others

Opportunities in Prediabetes and Diabetes Screening

- Screening and counselling revenue opportunities
- Medication review
- Identification of patient with diabetes – loyal, long-term client
 - Supplies, prescriptions, incidental sales
- Identification of patient with prediabetes or diabetes
 - Lifestyle programs

OVERWEIGHT & OBESITY

Body Composition Analysis Clinic

- Excess body fat = ↑ health risk
 - Normal BMI = 25 kg/m²
 - Ideal BMI = 23 kg/m²
- Body composition analyzer allows assessment of total body fat, total body water, and total body weight
- Promotes discussion of health risks and target weight loss



Case: The Overweight Plumber

John is a 29-year-old plumber who is worried that he is getting “out of shape.” He has heard about the clinic that you are conducting that assesses body composition and he drops into the pharmacy on his lunch hour.

After the test, John is shocked to hear that he is actually overweight with a body mass index of 27.8 kg/m^2 . His percentage fat is 19.1% (desirable is 14-20%). John discusses a “getting back into shape” plan of action with you.

John's Body Composition Analyzer Printout

[REDACTED]
BODY COMPOSITION
ANALYZER

BODY TYPE	STANDARD
GENDER	MALE
AGE	29
HEIGHT	5ft 11.0in
WEIGHT	199.6lb
BMI	27.8
BMR	8459 kJ
	2022kcal
IMPEDANCE	401 Ω
FAT%	19.1%
FAT MASS	38.2lb
FFM	161.4lb
TBW	118.2lb
DESIRABLE RANGE	
FAT%	14-20%
FAT MASS	26.2-40.4lb

Opportunities in Weight Management Programs

- Weight management program revenue opportunities
- Nutrition and physical activity counselling, group sessions
- Scales, nutrition scales, pedometers, etc.
- Medication review
- Should we be selling weight reduction products in our pharmacy that are not evidence-based?

Tying It All Together

- Are clinics a good business opportunity?
 - Consider:
 - Costs
 - Cost of clinic equipment rental, etc. (~ \$500/wk)
 - Staff required to prepare and run clinic
 - Revenues
 - Charge per person
 - Extra services (e.g., medication reviews)
 - Lifestyle program charges
 - Add-on sales
 - Client loyalty (i.e., ongoing sales)
 - Should we be charging for clinics?
 - How do we create the value proposition?

Questions???