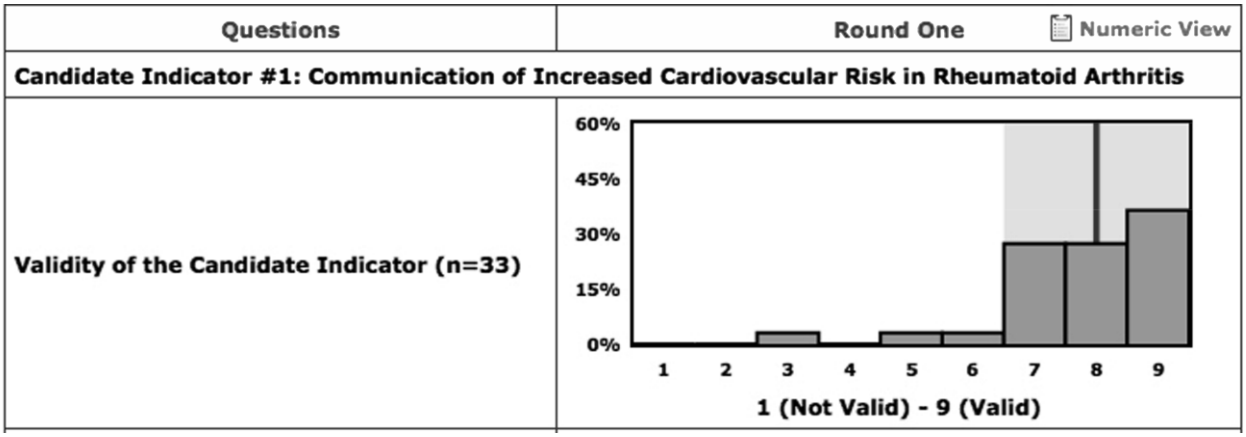
APPENDIX 1. Example of the ExpertLens platform demonstrating panelists' display of an indicator. This screenshot demonstrates what a panelist views during Round 2 and Round 3: a bar chart showing the frequency of each response category, a group median (vertical line), interquartile range (shaded area around the median). Note: color version adapted for publication in black and white.



APPENDIX 2. Final set of 11 cardiovascular quality indicators for rheumatoid arthritis: full specifications.

Candidate Measure #1: Communication of Increased Cardiovascular Risk in Rheumatoid Arthritis

Quality Indicator: IF a patient has rheumatoid arthritis (RA), THEN the treating rheumatologist should communicate to the primary care physician (PCP), at least once within the last 2 years that patients with RA have an increased cardiovascular risk.

Numerator	Adult patients (18 years and older) with a diagnosis of RA whose rheumatologist has communicated* to the PCP that RA is associated with increased cardiovascular risk at least once within the last 2 years. *Communication of increased cardiovascular risk includes but is not limited to: - Documenting in a letter or other means of communication back to the PCP that patients with RA have an increased risk of cardiovascular disease.

	- Documenting in a letter or other means of communication back to the PCP or in the medical chart that the patient was notified about the increased cardiovascular risk associated with RA and told to follow-up with the PCP. - Completion of a formal cardiovascular risk assessment with communication to the patient or to the PCP can also contribute to the numerator but is not necessary for fulfillment of this measure. Note: It should be noted that some patients with RA have a higher cardiovascular risk than others. RA patients with the following features have an increased cardiovascular risk: • Seropositive disease (RF or anti-CCP positivity) • Disease duration ≥ 10 years • Presence of extra-articular manifestations However, the PCP should be alerted to the potential of increased cardiovascular risk in all patients to reinforce change in modifiable risk factors in RA patients.
Denominator	Adult patients with RA (18 years and older) who have been seen by a rheumatologist at least twice over a period of two years.
Denominator Exclusions	Documentation of a reason for not communicating an increased cardiovascular risk associated with RA: - Palliative patients - Patient is already under the care of a cardiologist or internist for established cardiovascular disease or cardiovascular risk reduction and already receiving appropriate treatment and screening - No PCP caring for the patient
Period of Assessment	At any point over the course of available follow-up provided the rheumatologist has seen the patient at least twice during a two-year period.
Type of Measure	Process

Candidate Measure #2: Cardiovascular Risk Assessment

Quality Indicator: A) IF a patient has rheumatoid arthritis (RA) THEN a formal cardiovascular (CV) risk assessment according to national guidelines should be done at least once in the first two years after evaluation by a rheumatologist AND B) if low risk it should be repeated once every 5 years; OR C) if initial assessment suggests intermediate or high-risk, THEN treatment of risk factors according to national guidelines should be recommended.

Numerator	A) Adult patients (30 years and older)* with a diagnosis of RA who have documentation in their medical record of a formal CV risk** assessment done once within the first two years after evaluation by a rheumatologist using a validated cardiovascular risk score according to national guidelines. **Examples include but are not limited to: Framingham Risk Score, SCORE, QRISK, Reynolds Risk Score, Atherosclerotic Cardiovascular Disease (ASCVD) risk estimator. Use of a CV risk assessment tool that adjusts for the presence of RA is *suggested* but not necessary for fulfillment of this indicator. AND B) If low risk according to initial risk assessment then risk scores are repeated once every 5 years OR C) If intermediate or high risk THEN it is recommended*** that treatment of risk factors be initiated according to national guidelines. ** The cardiovascular risk scores described above are each validated for a defined lower age limit: if using QRISK lower age limit is 25; if using Framingham 10-year risk prediction lower age limit is 30; if using SCORE method lower age limit is 40 etc. Evaluation for modifiable risk factors should occur in younger ages as described in other indicators;

	however, given limited validity of risk calculators in younger age groups (18-29 years) they are not included in this indicator. ***Appropriate means of conveying this recommendation include but are not limited to: - Documentation in a letter or other means of communication to the primary care physician (PCP or other healthcare provider) that the patient is at intermediate or high CV risk and that treatment of risk factors should be initiated as indicated according to national guidelines. - Documenting that this information was given to the patient and they were told to follow-up with their PCP (or other healthcare provider) to discuss modification of risk factors. - Documentation that the rheumatologist made treatment adjustments, initiated therapy or made recommendations to address modifiable risk factors. Note: This quality indicator can be reported as 3 quality measures: - A) Percentage of patients with RA with a documented cardiovascular risk assessment within 2 years of evaluation by a rheumatologist. - B) Percentage of patients with RA with a "low risk" baseline cardiovascular risk score who have a risk assessment repeated at least once every 5 years. - C) Percentage of patients with RA with an "intermediate or high risk" baseline cardiovascular risk score AND who have documentation in their medical record that treatment of risk factors was recommended.
Denominator	A) All adult patients with RA (30 years and older) seen at least twice over a 2 year measurement period B) For low risk: number of patients (30 years and older) seen at least twice over a 5 year measurement period

	C) For intermediate or high risk: number of patients (30 years and older) seen at least twice over a 2 year measurement period
Denominator Exclusions	Documentation of a reason for not recommending CV risk assessment including: - Palliative patients - Documented patient refusal of CV risk assessment - Those already under the care of a cardiologist or internist for *known cardiovascular disease* (e.g. previous stroke, peripheral vascular disease or ischemic heart disease) and already receiving appropriate screening and treatment of modifiable risk factors - If another treating physician or care provider has conducted a screening CV risk assessment according to national guidelines, and this is clearly documented in the medical record, then this obviates the need for the rheumatologist to repeat the risk assessment and these cases would contribute to the denominator exclusions.
Period of Assessment	A) Low-risk: 5 year measurement period B) Intermediate or high risk: 2 year measurement period
Type of Measure	Process

Candidate Quality Indicator #3: Smoking Status and Cessation Counseling

Quality Indicator: A) IF a patient has rheumatoid arthritis (RA) THEN their smoking and tobacco use status should be documented at least once in the last year AND B) if they are current smokers or tobacco users they should be counseled to stop smoking.

Numerator	A) Adult patients (18 years and older) with RA who had their smoking and tobacco use status documented one or more times in the medical record in the last year AND B) if they were current smokers or tobacco users they were counseled* to stop smoking or using tobacco. *Counseling includes but is not limited to: - Documenting that the patient was counseled to stop smoking

	- Patient was prescribed a medication to assist with smoking cessation - Letter or other means of communication from rheumatologist has requested that the primary care provider discuss smoking cessation with the patient - Patient was provided with written smoking cessation information - Patient was referred (or provided a self-referral number) to a smoking cessation intervention Note this indicator provides two quality measures: A) Percentage of RA patients who have their smoking status documented at least once during the measurement period. B) Percentage of RA patients who are current tobacco users who are counseled to stop smoking.
Denominator	A) Patients 18 years and older with a diagnosis of RA seen at least once during the measurement period. B) Patients 18 years and older with a diagnosis of RA seen at least once during the measurement period who are current smokers.
Denominator Exclusions	Documented life-long non-smoker
Period of Assessment	1 year measurement period
Type of Measure	Process

Candidate Quality Indicator #4: Screening for Hypertension

Quality Indicator: IF a patient has rheumatoid arthritis THEN their blood pressure should be measured and documented in the medical record at ≥ 80% of clinic visits.

Numerator	Adult patients with RA (18 years and older) who have had a blood pressure measured at ≥ 80% of clinic visits per year and documented in their medical record.

	Note: documentation that the blood pressure was "normal" but not reporting the value is insufficient for inclusion in the numerator
Denominator	All patients 18 years and older with a diagnosis of RA at the start of the measurement period.
Denominator Exclusions	- Documented physician reason why blood pressure can't be measured - Documented patient refusal - Palliative patient
Period of Assessment	1 year measurement period
Type of Measure	Process

Candidate Quality Indicator #5: Communication to Primary Care Physician About a Documented High Blood Pressure

Quality Indicator: IF a patient has rheumatoid arthritis AND has a blood pressure measured during a rheumatology clinic visit that is elevated (systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90) THEN the rheumatologist should recommend that it be repeated and treatment initiated or adjusted if indicated

Numerator	Adult patients with RA (18 years and older) who have had a blood pressure measured during a rheumatology clinic visit that is elevated (systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90) AND the rheumatologist has recommended that the blood pressure be repeated and antihypertensive treatment initiated or adjusted if indicated. Appropriate means of conveying this information include but are not limited to: 1. Having the patient repeat the blood pressure measurement at home and following up with their PCP (or other healthcare provider) if elevated for appropriate treatment if indicated. 2. Ordering or advising the PCP (or other healthcare provider) to order 24-hr ambulatory blood pressure monitoring for the patient and follow-up with their PCP (or other healthcare provider) if elevated for appropriate treatment if indicated.

	3. Documentation in a letter or other means of communication to the PCP (or other healthcare provider) the need to repeat the blood pressure and initiate or adjust antihypertensive treatment if indicated. 4. Documenting this information was given to the patient and they were told to follow-up with their PCP (or other healthcare provider) to repeat the blood pressure and get treatment if indicated. 5. Documentation that the rheumatologist made an anti-hypertensive treatment adjustment or initiated anti-hypertensive therapy. Note: lower target thresholds may be indicated for patients with diabetes and chronic kidney disease but are not captured within this indicator. More urgent or aggressive approaches may be warranted in more severe hypertensive stages; however, it is out of the scope of the present quality indicator to create specific measures for each hypertensive stage.
Denominator	All adult patients with RA (18 years and older) with a diagnosis of rheumatoid arthritis and an elevated blood pressure measurement defined as a systolic blood pressure $\geq$ 140 and/or diastolic blood pressure $\geq$ 90.
Denominator Exclusions	- Patients with concomitant diabetes or chronic kidney disease where a lower threshold target threshold may be more appropriate - Documented blood pressure target that is above the 140/90 threshold for medical reasons (e.g. very elderly frail individual with severe postural hypotension). - Palliative patient
Period of Assessment	1 year measurement period
Type of Measure	Process

Candidate Quality Indicator #6: Measurement of a Lipid Profile

Quality Indicator: IF a patient has rheumatoid arthritis (RA) THEN a lipid profile should be done *at least* once in the first two years after evaluation by a rheumatologist AND A) if low risk according to cardiovascular risk scores, the lipid profile should be repeated once every 5 years; OR B) if cardiovascular risk assessment suggests intermediate or high-risk, then treatment according to national guidelines should be recommended.

Numerator	Adult patients (18 years and older) with a diagnosis of rheumatoid arthritis (RA) who have documentation in their medical record of a lipid profile assessment done once within the first two years after evaluation by a rheumatologist. AND A) A) If low risk according to initial risk assessment*, then lipid profile is repeated once every 5 years. OR B) If intermediate or high risk according to initial risk assessment*, then recommendation that patients be treated according to national guidelines. Appropriate means of conveying this information include but are not limited to: 1. Documentation in a letter or other means of communication to the primary healthcare provider (PCP or other healthcare provider) the need to start or adjust lipid-lowering treatment if indicated. 2. Documenting this information was given to the patient and they were told to follow-up with their PCP (or other healthcare provider) to discuss their abnormal lipid profile. 3. Documentation that the rheumatologist made treatment adjustments or initiated lipid-lowering therapy.

	*Examples include but are not limited to: Framingham Risk Score, SCORE, QRISK, Reynolds Risk Score, ASCVD risk estimator. Use of a CV risk assessment tool that adjusts for the presence of RA is *suggested* but not necessary for fulfillment of this indicator. Note: testing for Apolipoprotein B (ApoB) instead of routine lipid screening may also be counted in the numerator, but is not necessary for fulfillment of this indicator. Note: Lipid profiles do not need to be repeated if done within the specified time frame by another physician. Note: More frequent lipid measurement and cardiovascular risk assessment may be warranted following major treatment changes (e.g. addition of corticosteroids, addition of tocilizumab etc.). Note: Patient might still be eligible for therapy according to national guidelines if LDL-C very high (e.g. >5mmol/L in Canadian guidelines)
Denominator	A) For low risk: number of patients (18 years and older) seen at least twice over a 5 year measurement period B) For intermediate or high risk: number of patients (18 years and older) seen at least twice over a 2 year measurement period
Denominator Exclusions	- Documented physician reason for not performing the test - Documented patient refusal - Palliative patient
Period of Assessment	A) Low-risk: 5 year measurement period B) Intermediate or high risk: 2 year measurement period
Type of Measure	Process

Candidate Quality Indicator #7: Screening for Diabetes

Quality Indicator: IF a patient has RA THEN diabetes should be screened for as part of a cardiovascular (CV) risk assessment at least once within the first 2 years of evaluation by a rheumatologist and A) once every 5 years in low risk patients or B) yearly in intermediate or high-risk patients AND if screening is abnormal, this information should be communicated to the primary care provider (PCP) for appropriate follow-up and management if indicated.

Numerator	Patients 18 years of age and older with a diagnosis of RA who have had a fasting glucose AND/OR a Hemoglobin A1C to screen for diabetes at least once within 2 years of first seeing a rheumatologist. AND A) Every 5 years in low risk patients as part of a cardiovascular risk assessment OR B) Yearly in patients at intermediate or high risk* for diabetes Note: *Patients at High or Intermediate Risk for diabetes include patients with the following risk factors: - Family history of type 2 diabetes in a first degree relative - History of metabolic syndrome - Obesity or overweight (body mass index ≥ 25 kg/m2) - Steroid use - History of gestational diabetes or a macrosomic infant - History of impaired fasting glucose - History of hypertension (blood pressure ≥ 140/90 mmHg) - Member of a high risk population (e.g. aboriginal, Asian, Hispanic, South Asian, African, Pacific Islanders) - High risk based on validated diabetes risk calculators

	- High or intermediate cardiovascular risk based on cardiovascular risk calculators (Framingham, SCORE etc.) Low risk patients refer to patients without risk factors for diabetes on history or physical exam and that are also at low risk for cardiovascular disease based on a formal cardiovascular risk assessment and not taking steroids. Note: More frequent or specialized testing (for example the homeostasis model assessment (HOMA) estimated Insulin Resistance) may be indicated in some high-risk groups including patients on corticosteroids but is not within the scope of this quality indicator.
Denominator	A) For low risk: Number of patients (18 years and older) seen at least twice over a 5 year measurement period B) For intermediate or high risk: Number of patients (18 years and older) seen at least twice over a 2 year measurement period
Denominator Exclusions	- Diabetes already diagnosed and managed by an appropriate care provider according to national guidelines. - Palliative patient - Documented patient refusal to be screened - Documented other physician reason why screening not appropriate - Fasting glucose or hemoglobin A1C do not need to be repeated if done within the specified time frame if ordered by another physician
Period of Assessment	A) Low-risk: 5 year measurement period B) Intermediate or high risk: 2 year measurement period
Type of Measure	Process

Candidate Quality Indicator #8: Exercise

Quality Indicator: IF a patient has rheumatoid arthritis THEN physical activity goals should be discussed with their rheumatologist at least once yearly.

Numerator	Adult patients with rheumatoid arthritis (18 years of age and older) who have discussed* physical activity goals with their rheumatologist at least once within the last year. *Discussion may include but is not limited to: - Directing patients to a physiotherapist for physical activity assessment and recommendations - Directing patients to an appropriate community or hospital physical activity program - Directing patients to information about National physical activity guidelines - Documented discussion in chart about increasing physical activity Note: Discussion about physical activity goals and exercise is an important part of comprehensive rheumatology care and should occur as part of every patient encounter. A once yearly evaluation as part of a holistic assessment is considered a minimum.
Denominator	Adult patients with RA (18 years and older) who have been seen by a rheumatologist at least once over the last year.
Denominator Exclusions	Documented reason why physical activity is not recommended: palliative patient, patient documented refusal, wheelchair bound patient, other significant co-morbidity preventing an increase in physical activity
Period of Assessment	1 year measurement period
Type of Measure	Process

Candidate Quality Indicator #9: BMI Screening and Lifestyle Counseling

Quality Indicator: A) IF a patient has rheumatoid arthritis (RA) THEN their body mass index (BMI) should be documented at least once every year AND B) if they are overweight or obese according to national guidelines they should be counseled to modify their lifestyle.

Numerator	A) Adult patients (18 years of age and older) with a diagnosis of RA who had their BMI calculated at least once every year

	AND B) If overweight or obese according to national guidelines were counseled* to modify their lifestyle. *Examples of counseling include but are not limited to: - Referral to a registered dietician (or documented recommendation to general practitioner to do so) - Following national food guide - Following an endorsed "heart health healthy diet" (e.g. Mediterranean diet, DASH diet) - Diet discussed and brochure provided - Weight reduction - Moderating caloric intake - Increasing physical activity - Told to follow-up with primary care practitioner or other allied health professional to seek weight loss advice. Note: If waist circumference, body fat percentages, or other clear documentation that the patient is overweight or obese are used instead of BMI, these cases can be included in the numerator. This quality indicator provides two quality measures: A) Percentage of adult patients with RA who had their BMI calculated at least once within the last year. B) Percentage of adult patients with RA who were overweight or obese who were counseled to modify their lifestyle.
Denominator	A) Adult patients with RA (18 years and older) who have been seen by a rheumatologist at least once in the last year. B) Adult patients with RA (18 years and older) who have been seen by a rheumatologist at least once in the last year and who are overweight or obese according to national guidelines.
Denominator Exclusions	- Physician documented exclusion including patient refusal to discuss, patient already followed by a dietician or other care provider for weight loss.

	- Palliative patient
Period of Assessment	2 year measurement period
Type of Measure	Process

Candidate Quality Indicator #10: Minimizing Corticosteroid Usage

Quality Indicator: IF a patient with rheumatoid arthritis (RA) is on oral corticosteroids THEN there should be evidence of intent to taper off the corticosteroids or reduce to the lowest possible dose

Numerator	Adult patients (18 years and older) with a diagnosis of RA who are on oral corticosteroids and who have a documented written plan to taper off corticosteroids or decrease to the lowest possible dose. Evidence of intent to taper steroids includes: A written plan in the chart or a letter or other means of communication back to the primary care provider (PCP) detailing the plan for the corticosteroid taper - A copy of a corticosteroid taper calendar in the chart or documentation that one was given to the patient - Mention of initiating a taper (without further specification detailed) - Evidence that dose of corticosteroids was reduced or stopped over the 1 year measurement period based on pharmacy data
Denominator	Number of patients 18 years of age and older with a diagnosis of RA who are on corticosteroids at any dose during the measurement period.
Denominator Exclusions	- Documented contraindication to tapering prednisone (e.g. existing or presumed adrenal insufficiency either primary or secondary)

	- Corticosteroid was prescribed for another indication (e.g. malignancy, other inflammatory condition or extra-articular feature requiring steroid treatment, end-stage COPD) - Patient refusal to taper - Other documented physician reason why taper is inappropriate (e.g. presence of other significant comorbidities precluding other treatments, palliative patient for symptom control)
Period of Assessment	1 year measurement period
Type of Measure	Process

Candidate Quality Indicator #11: Communication About Risks/Benefits of Anti-Inflammatories in Patients at High Risk of Cardiovascular Events

Measure Description: IF a patient has rheumatoid arthritis (RA) AND has established cardiovascular disease OR is at intermediate or high cardiovascular risk AND is on a non-steroidal anti-inflammatory drug (NSAID or Cox-2 inhibitor) THEN a discussion about the potential cardiovascular risks should occur and be documented

Numerator	Adult patients (18 years of age and older) with RA and known cardiovascular disease (or at intermediate or high risk for cardiovascular disease) who are prescribed anti-inflammatories including non-steroidal anti-inflammatory (NSAID) or Cox-2 inhibitors (COXIBS) and have a documented* discussion about the risks and benefits of using anti-inflammatory drug in their medical record. *Documentation of the discussion of risks and benefits can include but is not limited to: - Documentation that a discussion of risks and benefits of NSAID and COXIB use occurred - Documentation that written information detailing the risks and benefits was provided to the patient

	- Documentation that cardiovascular risks were minimized by using an anti-inflammatory with a known lower or neutral cardiac risk profile - Documentation that the patient was informed of the risks and it was their preference to continue or start an anti-inflammatory for symptom relief - Documentation that risks and benefits were considered but no other treatment options were viable for management of patient symptoms (other RA treatments maximized and other pain medications contraindicated for other reasons)
Denominator	Patients 18 years of age and older with a diagnosis of rheumatoid arthritis (RA) and known cardiovascular disease (or high risk for cardiovascular disease). Includes patients with but not limited to: Past history of myocardial infarction or ischemic heart disease Past history of Stroke History of peripheral vascular disease Intermediate or High risk based on a validated cardiovascular risk score* *Examples of cardiovascular risk assessment tools include but are not limited to: Framingham Risk Score, SCORE, QRISK, Reynolds Risk Score, ASCVD risk estimator.
Denominator Exclusions	None identified
Period of Assessment	1 year measurement period
Type of Measure	Process