

# Choosing Wisely Canada Clinical Audit of ANA Ordering Patterns in Community Rheumatology Referrals

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**A**nti-nuclear antibodies (ANA) can be found in the sera of many patients with rheumatic and non-rheumatic conditions, as well as in healthy people. While the average sensitivity of ANA in patients with systemic lupus erythematosus is 93%, up to 20% of healthy people will also test ANA positive.<sup>1</sup> Consequently, the testing of these autoantibodies must be done in the right clinical context, to avoid both unnecessary testing and erroneous interpretation of results.<sup>1-3</sup>

Members of the Canadian Rheumatology Association (CRA) recently identified ANA as a test that was often inappropriately ordered in adults.<sup>4</sup> This can result in further unnecessary testing, erroneous diagnosis or even inappropriate therapy.<sup>1</sup> As well, unnecessary testing of ANA contributes further to the growing Canadian healthcare budget, which was estimated to reach 11.5% of the gross domestic product (GDP) in 2017.<sup>5</sup>

In an effort to decrease unnecessary testing, the CRA published recommended indications for ANA testing in 2015 as part of the Choosing Wisely Canada campaign.<sup>4</sup> These recommendations were in keeping with guidelines published in 2013 by the Government of British Columbia (BC).<sup>6</sup> Principally, the recommendations outline that ANA testing should be ordered only if the clinician feels there is a reasonable clinical suspicion of systemic lupus erythematosus (SLE) or connective tissue disease (CTD) based on historical information, physical findings, and results of other laboratory tests. While recommendations aim to reduce the frequency of ANA testing, they have been shown to carry a very low risk of missing an underlying case of CTD.<sup>7</sup>

Since the publication of the Choosing Wisely recommendations two years ago, we have sought to evaluate the ANA ordering patterns within our local referral network, composed primarily of general practitioners. Additionally, we wanted to identify how often a positive ANA result triggered a rheumatology referral. Lastly, we assessed whether raising awareness of published recommendations would alter ANA ordering patterns within our community.

## Methods

We conducted a retrospective chart review of consecutive new referrals received using a convenience sampling method. We excluded referrals sent for a second opinion, repeat referrals

or referrals for a specific procedure (*e.g.* joint injection). We determined from the information provided in the referral whether an ANA was indicated based on published Choosing Wisely criteria and BC recommendations (Table 1). We also determined if the clinical question pertained specifically to a positive ANA, and thus, triggered the referral. Following our baseline data, we mailed an information pamphlet highlighting the published Choosing Wisely and BC recommendations regarding ANA testing to offices of general practitioners (GPs) in the surrounding community. We also conducted two in-house educational sessions for community GPs and nurse practitioners covering the same information as the pamphlets. We subsequently repeated our baseline analysis on a second independent sample of referrals received approximately two months following our intervention.

## Results

We reviewed 100 consecutive new referrals from October 2016 to March 2017. Forty-six per cent (46%) of referrals had an ANA measured. Of these, 81% did not meet the recommended indications for ANA testing. Of the ANA's done without an indication, 59% were negative compared to only 33% of the indicated ANA's (Figure 1). Twenty percent of referrals

Table 1.

### Recommendations for ANA testing

#### Indications for ANA testing

Patients with specific signs or symptoms of systemic lupus erythematosus or other connective tissue disease

#### ANA testing not indicated

Patients without at least one of the following symptoms:

- Pleurisy or pericarditis
- Photosensitive rash
- Laboratory evidence of renal disorder
- Hemolytic anemia, immune thrombocytopenia or neutropenia
- Skin changes of scleroderma, dermatomyositis or vasculitis
- Clinical and laboratory evidence of myositis
- Raynaud's phenomenon
- Neurologic signs

To confirm a diagnosis of rheumatoid arthritis or osteoarthritis

To evaluate fatigue, back pain, or other musculoskeletal pain unless accompanied by one or more of the clinical findings listed above

Figure 1.

### Serum ANA Titres in Indicated vs. Non-Indicated Group

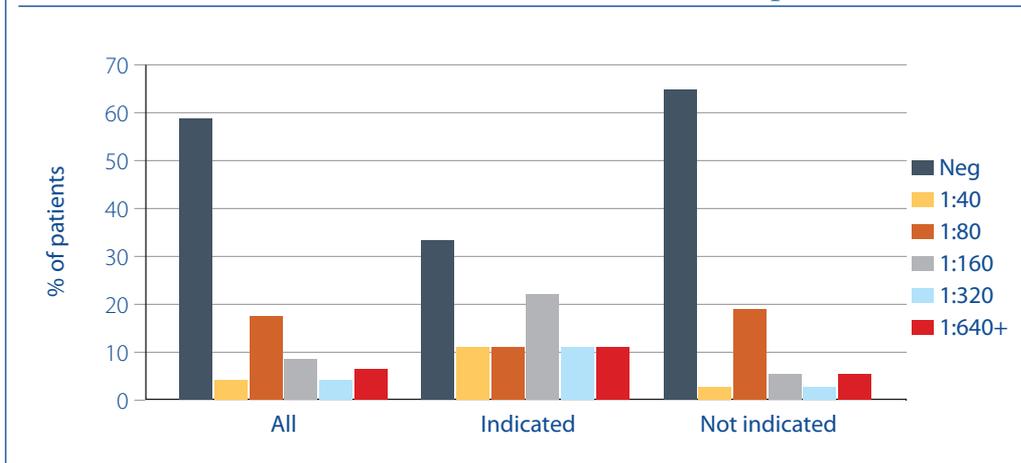


Table 2.

### Pre- and Post-intervention Comparison

	Pre-intervention	Post-intervention	P-value
Age (SD)	53.1 (17.7)	56.1 (17.7)	0.194
Gender (% female)	61%	62%	0.906
Frequency of ANA (% referrals)	46%	48%	0.817
ANA indicated	19.5%	37.5%	0.046*
ANA mentioned in referral question	20%	20%	1.00
Indicated ANA mentioned in referral question	35%	70%	0.239

were requested primarily for interpretation of a positive ANA. Of these, 13 (65%) had an ANA test that was not indicated.

Following our intervention, we reviewed 50 consecutive new patient referrals using the same parameters as our initial sample. We found no significant difference in frequency of ANA testing; however, a significant improvement in the proportion of ANA's meeting indications for testing was noted (Table 2). There was no significant difference in the number of referrals for positive ANA, but again an overall trend towards improvement in adherence to recommended indications for ANA testing was observed.

### Conclusion

We found serum ANA is frequently ordered among patients referred for rheumatology consultation. Despite published recommendations, we found that the majority of ANA testing is not indicated. This is consistent with results from other Canadian sites<sup>8</sup> and the U.S.<sup>9</sup> Apart from contributing to healthcare costs, we found that a large proportion of unnecessary ANA tests will also result in referral to the rheumatology clinic. This is of concern as access to rheumatologists is already limited within many parts of Canada, with wait times for patients with suspected rheumatic disease exceeding established benchmarks.<sup>10</sup>

With respect to reducing unnecessary ANA ordering, we found that raising awareness regarding the Choosing Wisely recommendations produced a significant reduction in the proportion of inappropriate ANA testing among our referrals. Nonetheless, there was no reduction in the frequency of ANA's ordered or the number of referrals for positive ANA. We suspect that this is most likely due to primary providers ensuring that they list an accepted indication within their referrals rather than ordering ANA less frequently. Thus, although further education for the use of ANA should be part of our strategy, a varied approach is likely required. Similar educational interventions have been successful to reduce the rate of unnecessary ANA testing among rheumatologists.<sup>11</sup>

Other strategies, such as a laboratory algorithm for ANA testing, have also proven successful<sup>8</sup> and should be considered. It is nonetheless clear that inappropriate ANA testing remains a common issue in rheumatology referrals and further research regarding both causes and effective intervention strategies is needed.

Limitations of our study include potential for observer bias. As well, conclusions regarding the intervention effect are limited due to lack of controls and potential for Hawthorne effect.

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