

## **New Company Name**

As of November 1st 2007, MDS Metro has a new name: LifeLabs. This change of name is a result of our February 2007 sale to Borealis Infrastructure, a division of OMERS, one of Canada's largest pension funds.

To help us select our new name, we held focus groups with physicians, patients and employees whose comments inspired our choice. We believe our new name serves as a reminder of the dedicated people behind our tests, the patients' lives they touch every day, and the health professionals they support.

Over the coming weeks and months you should begin to notice a change in our building signs, courier vehicles and employee uniforms as we integrate our new name into our business.

You can be assured that only our name and logo are changing. The same dedicated staff will continue to deliver the same high quality laboratory services you have come to expect.

While this change in name is a significant milestone in our company's history, it also signifies the conclusion of our change in ownership from MDS to Borealis. We look forward to continuing to serve you under our new name: LifeLabs.

## **Monoclonal Gammopathy of Uncertain Significance**

*Dr. Michael Moss, Medical Biochemist*

Monoclonal gammopathy of uncertain significance (MGUS) is defined by the presence of an abnormal amount of a single immunoglobulin (monoclonal spike, or M-component) in the absence of any other features of multiple myeloma or a related malignant disorder (e.g. Waldenström's macroglobulinemia, primary amyloidosis, B-cell lymphoma, chronic lymphocytic leukemia).

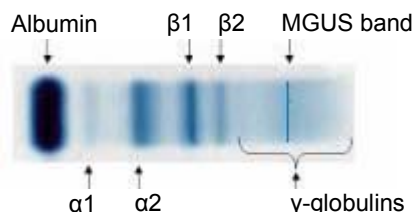
The incidence of MGUS is about 0.03% in individuals >50 years and increases with age. Prevalence ranges from 3% in patients >50 years to 5% in those >70 years, 10% in >80 years and >20% in those older than 90 years. The prevalence is higher in men than in women (4% vs 2.7% among those >50 years). The majority of patients with MGUS will develop no clinical complications, and have a normal life expectancy.

IgG is the immunoglobulin most commonly involved (about 70%), followed by IgM and IgA. About 25% of patients with MGUS show a corresponding reduction in the concentration of uninvolved immunoglobulins.

### **Pathogenesis**

Monoclonal gammopathy occasionally develops secondary to another condition. Such conditions include infections and inflammatory processes (e.g. rheumatoid arthritis, chronic liver disease due to hepatitis C), transplants of inorganic material, and some malignancies. Some tumours, such as melanoma, are particularly noted for evoking a vigorous immune response and an M-spike. Processes of infection or immune dysregulation may serve as the precipitating event for the translocations in the clonal plasma cells that are observed in 50% of patients with MGUS. These translocations may initiate and sustain clonal proliferation. Deletion of chromosome 13, which is a major prognostic factor in multiple myeloma, is also seen in up to 50% of patients with MGUS, so this abnormality cannot be used to differentiate MGUS from myeloma.

*Serum protein electrophoresis gel showing MGUS band in gamma globulins fraction*



### **Diagnostic criteria**

The detection of MGUS is usually an incidental finding unrelated to the reason for which the patient sought care. Patients with MGUS have no symptoms related to the monoclonal gammopathy, whereas the finding of pallor, bone tenderness or soft tissue masses suggests multiple myeloma.

#### ***Diagnostic criteria for MGUS, smouldering multiple myeloma (SMM) and multiple myeloma (MM)***

	<u>MGUS</u>	<u>SMM</u>	<u>MM</u>
M-component	<30 g/L	>30 g/L	>30 g/L
Clinical symptoms*	absent	absent	present
Bone marrow plasma cells (%)	<10	>10	>10

\*hypercalcemia, renal failure, anemia, skeletal involvement (lytic lesions), recurrent bacterial infections, extramedullary plasmacytomas

### ***Recommended testing in patients with suspected MGUS***

- History and physical examination
- Hemoglobin, serum calcium, serum creatinine
- Total serum protein and serum protein electrophoresis
- 24-hr urine protein and urine protein electrophoresis
- Serum and urine protein immunofixation
- Optional: bone marrow examination & skeletal survey

### **Progression to multiple myeloma**

Most patients with MGUS will develop no clinical complications and have a normal life expectancy. The annual rate of progression of MGUS to MM or another related disorder is about 1% and is not affected by age or duration of MGUS. Half of patients with MGUS will die from an unrelated cause. Progression is more likely with a serum concentration of monoclonal protein higher than 15 g/L, an increased percentage of plasma cells in the bone marrow, and involvement of IgA or IgM rather than IgG.

*(continued on p. 4)*

## **Dr. Q's Question of the Month**

What laboratory tests should I order initially if I suspect that my patient has an anemia?

**Answer on p. 4**



**BURNABY REFERENCE LABORATORY ANTI BIOGRAMS**

Dr. Colette Pienaar, Medical Microbiologist

The following antibiograms are profiles of antimicrobial susceptibility testing results of commonly reported respiratory tract, skin and soft tissue and urinary tract pathogens submitted to our laboratory **between June 1, 2006 and May 31, 2007**. The information in the antimicrobial susceptibility profiles is to be used only as a guide, and we emphasize that culture and susceptibility testing are required for accurate determination of etiology and antimicrobial susceptibility. For further information contact a medical microbiologist at 1-800-431-7206. To obtain laminated copies free of charge, phone Client Services at 1-800-431-7206.

**Respiratory Tract Pathogens**

The most commonly isolated respiratory tract pathogens were *Haemophilus influenzae*, *Moraxella catarrhalis*, *Streptococcus pneumoniae* and *Pseudomonas aeruginosa*. Susceptibility testing for *M. catarrhalis* is not routinely performed. Most clinical isolates of *M. catarrhalis* are resistant to amoxicillin but are generally susceptible to amoxicillin clavulanate, macrolides, trimethoprim-sulfamethoxazole, quinolones, cefuroxime, cefixime, and ceftriaxone.

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)												
		Ampicillin	Azithromycin	Ceftazidime	Cefuroxime	Ciprofloxacin	Clarithromycin	Erythromycin	Gentamicin	Levofloxacin	Penicillin	Piperacillin	Tetracycline	Trimethoprim/Sulfamethoxazole
<i>Haemophilus influenzae</i>	283	86			100		97	R					98	79
<i>Streptococcus pneumoniae</i>	111	88	64			R	64	64	R	100	88		71	71
<i>Pseudomonas aeruginosa</i>	73	R	R	97	R	86	R	R	86		R	97	R	R

**Skin and Soft tissue Pathogens**

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)													
		Ampicillin	Azithromycin	Ceftriaxone	Cephalothin/Cephalexin	Ciprofloxacin	Clarithromycin	Clindamycin	Cloxacillin	Erythromycin	Levofloxacin	Penicillin	Tetracycline	Trimethoprim/Sulfamethoxazole	Vancomycin
Streptococcus group A	238	100	77	100	*	R	77	77		77	100	100		R	100
<i>Staphylococcus aureus</i> (MSSA)	4539				100				100	78		95			
<i>Staphylococcus aureus</i> (MRSA)	1963	R		R	R	7		61	R	5		R	90	93	100

**Please note:** Antimicrobial susceptibility testing for Streptococcus group A is not routinely performed but was performed at physician's request.

\* Streptococcus group A isolates that are susceptible to penicillin can be considered susceptible to cephalothin/cephalexin.

MSSA = Methicillin-susceptible *Staphylococcus aureus*; MRSA = Methicillin-resistant *Staphylococcus aureus*

**Urinary Tract Pathogens**

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)									
		Ampicillin	Cephalothin/Cephalexin	Ciprofloxacin	Gentamicin	Nitrofurantoin	Norfloxacin	Tetracycline	Trimethoprim/Sulfamethoxazole	Ceftazidime	Piperacillin
<i>Escherichia coli</i>	21537	60	58	83	93	96		75	79		
<i>Enterococcus</i> spp.	3237	99.5	R	77		98	62	22	R	R	
Streptococcus group B <sup>1</sup>	3033										
<i>Klebsiella pneumoniae</i>	1834	R	95	97	99	23		87	94		
<i>Proteus</i> spp.	1144	71	83	85	95	R		R	77		
<i>Staphylococcus saprophyticus</i> <sup>2</sup>	730										
<i>Staphylococcus aureus</i> (MSSA)	346		100	73		98	71	96	97		
<i>Pseudomonas aeruginosa</i>	299	R	R	76	82	R		R	R	93	99.7

<sup>1</sup>Antimicrobial susceptibility testing is not routinely performed on urine isolates of Streptococcus group B because such infections usually respond to antibiotics commonly used to treat uncomplicated urinary tract infections, such as ampicillin, cephalosporins and nitrofurantoin. Susceptibility to fluoroquinolones is variable.

<sup>2</sup>Antimicrobial susceptibility testing is not routinely performed on urine isolates of *Staphylococcus saprophyticus* because such infections usually respond to antibiotics commonly used to treat uncomplicated urinary tract infections, such as trimethoprim-sulfamethoxazole, nitrofurantoin and fluoroquinolones.

	90-100% of isolates are susceptible to the antibiotic indicated ( <b>GOOD CHOICE</b> )
	21-89% of isolates are susceptible to the antibiotic indicated ( <b>INTERMEDIATE CHOICE</b> )
	0-20% of isolates are susceptible to the antibiotic indicated ( <b>POOR CHOICE</b> )
R	The organism is inherently resistant to the antibiotic indicated <b>OR</b> is not recommended due to poor clinical response and/or poor activity
	Antimicrobial susceptibility testing not performed

**VICTORIA REFERENCE LABORATORY ANTI BIOGRAMS**

Dr. Colette Pienaar, Medical Microbiologist

The following antibiograms are profiles of antimicrobial susceptibility testing results of commonly reported respiratory tract, skin and soft tissue and urinary tract pathogens submitted to our laboratory between June 1, 2006 and May 31, 2007. The information in the antimicrobial susceptibility profiles is to be used only as a guide, and we emphasize that culture and susceptibility testing are required for accurate determination of etiology and antimicrobial susceptibility. For further information contact a medical microbiologist at 1-800-431-7206. To obtain laminated copies free of charge, phone Client Services at 1-800-431-7206.

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The most commonly isolated respiratory tract pathogens were *Haemophilus influenzae*, *Moraxella catarrhalis*, *Streptococcus pneumoniae* and *Pseudomonas aeruginosa*. Susceptibility testing for *M. catarrhalis* is not routinely performed. Most clinical isolates of *M. catarrhalis* are resistant to amoxicillin but are generally susceptible to amoxicillin clavulanate, macrolides, trimethoprim-sulfamethoxazole, quinolones, cefuroxime, and ceftriaxone.

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)												
		Ampicillin	Azithromycin	Ceftazidime	Cefuroxime	Ciprofloxacin	Clarithromycin	Erythromycin	Gentamicin	Levofloxacin	Penicillin	Piperacillin	Tetracycline	Trimethoprim/Sulfamethoxazole
<i>Haemophilus influenzae</i>	185	86			99		89	R					97	89
<i>Streptococcus pneumoniae</i>	62	83	73			R	73	73	R	98	83		71	75
<i>Pseudomonas aeruginosa</i>	92	R	R	90	R	77	R	R	85		R	94	R	R

**Skin and Soft tissue Pathogens**

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)													
		Ampicillin	Azithromycin	Ceftriaxone	Cephalothin/Cephalexin	Ciprofloxacin	Clarithromycin	Clindamycin	Cloxacillin	Erythromycin	Levofloxacin	Penicillin	Tetracycline	Trimethoprim/Sulfamethoxazole	Vancomycin
Streptococcus group A	46	100	83	100	*	R	83	83		83	100	100		R	100
<i>Staphylococcus aureus</i> (MSSA)	2525				100				100	82			95		
<i>Staphylococcus aureus</i> (MRSA)	839	R		R	R	11		82	R	7		R	93	97	100

**Please note:** Susceptibility testing for Streptococcus group A is not routinely performed but was performed at physician's request.

\* Streptococcus group A isolates that are susceptible to penicillin can be considered susceptible to cephalothin/cephalexin.

MSSA = Methicillin-susceptible *Staphylococcus aureus*; MRSA = Methicillin-resistant *Staphylococcus aureus*

**Urinary Tract Pathogens**

ORGANISM	Number of isolates tested	ANTIBIOTIC (% susceptible)									
		Ampicillin	Cephalothin/Cephalexin	Ciprofloxacin	Gentamicin	Nitrofurantoin	Norfloxacin	Tetracycline	Trimethoprim/Sulfamethoxazole	Ceftazidime	Piperacillin
<i>Escherichia coli</i>	10949	65	55	82	95	95		77	81		
<i>Enterococcus</i> spp.	1947	99.6	R	70		96	55	22	R	R	
Streptococcus group B <sup>1</sup>	1433										
<i>Klebsiella pneumoniae</i>	1124	R	95	97	99	27		88	93		
<i>Proteus</i> spp.	532	80	85	93	89	R		R	88		
<i>Staphylococcus saprophyticus</i> <sup>2</sup>	512										
<i>Pseudomonas aeruginosa</i>	291	R	R	68	84	R		R	R	95	97
<i>Staphylococcus aureus</i> (MSSA)	229		100	81		96	80	92	95		

<sup>1</sup>Antimicrobial susceptibility testing is not routinely performed on urine isolates of Streptococcus group B because such infections usually respond to antibiotics commonly used to treat uncomplicated urinary tract infections, such as ampicillin, cephalosporins and nitrofurantoin. Susceptibility to fluoroquinolones is variable.

<sup>2</sup>Antimicrobial susceptibility testing is not routinely performed on urine isolates of *Staphylococcus saprophyticus* because such infections usually respond to antibiotics commonly used to treat uncomplicated urinary tract infections, such as trimethoprim-sulfamethoxazole, nitrofurantoin and fluoroquinolones.

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	21-89% of isolates are susceptible to the antibiotic indicated ( <b>INTERMEDIATE CHOICE</b> )
	0-20% of isolates are susceptible to the antibiotic indicated ( <b>POOR CHOICE</b> )
R	The organism is inherently resistant to the antibiotic indicated <b>OR</b> is not recommended due to poor clinical response and/or poor activity
	Antimicrobial susceptibility testing not performed

Management of MGUS (continued from p. 1)

The current standard of care in managing patients with MGUS is monitoring in order to detect progression to multiple myeloma before the occurrence of complications such as renal failure or fractures. Since a proportion of patients with MGUS will progress to myeloma, the physician should alert the patient to clinical symptoms of possible malignant conversion, such as fatigue or bone pain.

Hemoglobin, serum calcium, creatinine, protein electrophoresis and urine protein electrophoresis should be repeated at three months, and again at six months. If the M-component remains stable, and there is no clinical or laboratory evidence of progression, then these laboratory studies may be repeated less frequently, i.e. annually.

Progression from MGUS to MM is usually abrupt, and associated with a sharp increase in M-protein. In some patients, the M-component increases gradually, exceeding 30 g/L but without any associated symptoms. These patients may meet the diagnostic criteria for *smouldering multiple myeloma* (SMM), which has a higher annual risk of progression to malignancy (10-20%), compared to MGUS (1%). No specific therapy is currently recommended for SMM, but more frequent follow up and laboratory studies (every 3-4 months) is advised, plus an annual skeletal survey.

References

1. Bladé J. Monoclonal gammopathy of undetermined significance. *N Engl J Med* 2006; 355:2765-2770.
2. Rajkumar SV. MGUS and Smoldering Multiple Myeloma: Update on Pathogenesis, Natural History, and Management. *Hematology* 2005; 340-345.
3. Rajkumar SV, Kyle RA, Therneau TM, et al. Serum free light chain ratio is an independent risk factor for progression in monoclonal gammopathy of undetermined significance. *Blood* 2005; 106:812-817.

**Answer to Dr. Q's Question**

The Complete Blood Count (**CBC**) will provide cell counts and hemoglobin level as well as many useful indices. The MCV, or the mean corpuscular volume, of the red cells provides a simple and practical classification of anemias. Microcytic anemias are seen in iron deficiency, anemia of chronic disease, thalassemia, and lead poisoning. The differential diagnosis for macrocytic anemia includes liver disease, alcohol abuse, B12/folate deficiency, cytotoxic drugs and myelodysplastic disorders.

The **reticulocyte count** (in absolute number) will assess the ability of the bone marrow to respond to the anemia. An increased reticulocyte count suggests blood loss, hemolysis or response to treatment (e.g. following the provision of the missing hematinic such as iron or B12). A decreased reticulocyte count suggests anemia of chronic disease, lack of hematinics or marrow failure.

A **blood film review** would complete the assessment and provides additional information that may explain the cause of the anemia. Physicians may order a blood film review (or interpretation) by the lab pathologist, but most laboratories will provide the blood film assessment if the CBC or certain indices are abnormal.

*Dr. Ekram Zayed, Hematopathologist*

**Editor-in-Chief:** Dr. Colette Pienaar  
**Associate Editor:** Dr. Jan Palaty

**Client Information Centre Corner**

New hours of operation

Monday to Friday	0600 - 2400 h
Saturday	0700 - 2100 h
Sunday <sup>1</sup>	0800 - 2000 h
Statutory holidays <sup>1,2</sup>	0900 - 1700 h



<sup>1</sup> Closed 1200 - 1300 h. Micro preliminary results are not available during this time; please phone after 1300 h. ECG results are not available on these days.

<sup>2</sup> Closed Christmas Day and New Year's Day.  
Open 0800 - 2000 h Easter Monday.

Requests for Stat testing

Please ensure that requests for STAT samples include an after hours contact number for the ordering (rather than on-call) physician for notification of stat test results as soon as they become available.

Different methods of conveying test results

Would it be more convenient for us to send patient results by fax rather than by phone? Call us to find out more. Also, consider Excelleris, for instant web-based access to patient results and many more options not available from a conventional faxed report. Excelleris is pleased to offer these services at no charge to the physician and can be contacted at 1-866-728-4777 or [www.excelleris.com](http://www.excelleris.com).



**New Chemistry Analyzers in Burnaby and Victoria**

New analyzers for routine chemistry tests are scheduled to go live in Victoria and Burnaby on November 13th and 26th, respectively. The new Siemens ADVIA instruments have a larger test menu, faster throughput and require smaller sample volumes, which will reduce the number of tubes of blood required for a typical chemistry testing panel.

Following an extensive validation study of the new platforms we have found that most reference ranges will not require any modification. Where applicable, updates to reference ranges will be clearly indicated on the patient report together with the effective date of modification.

As a value-added feature, our new system will automatically assess each serum specimen for the presence of lipemia and icterus. We will annotate the report if lipemia or icterus are observed and may significantly influence a specific test result.

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