ISSUE 5

Health Matters Bulletin

BY REBOOT HEALTH CONSULTANCY & ADVISORY SERVICES INC.

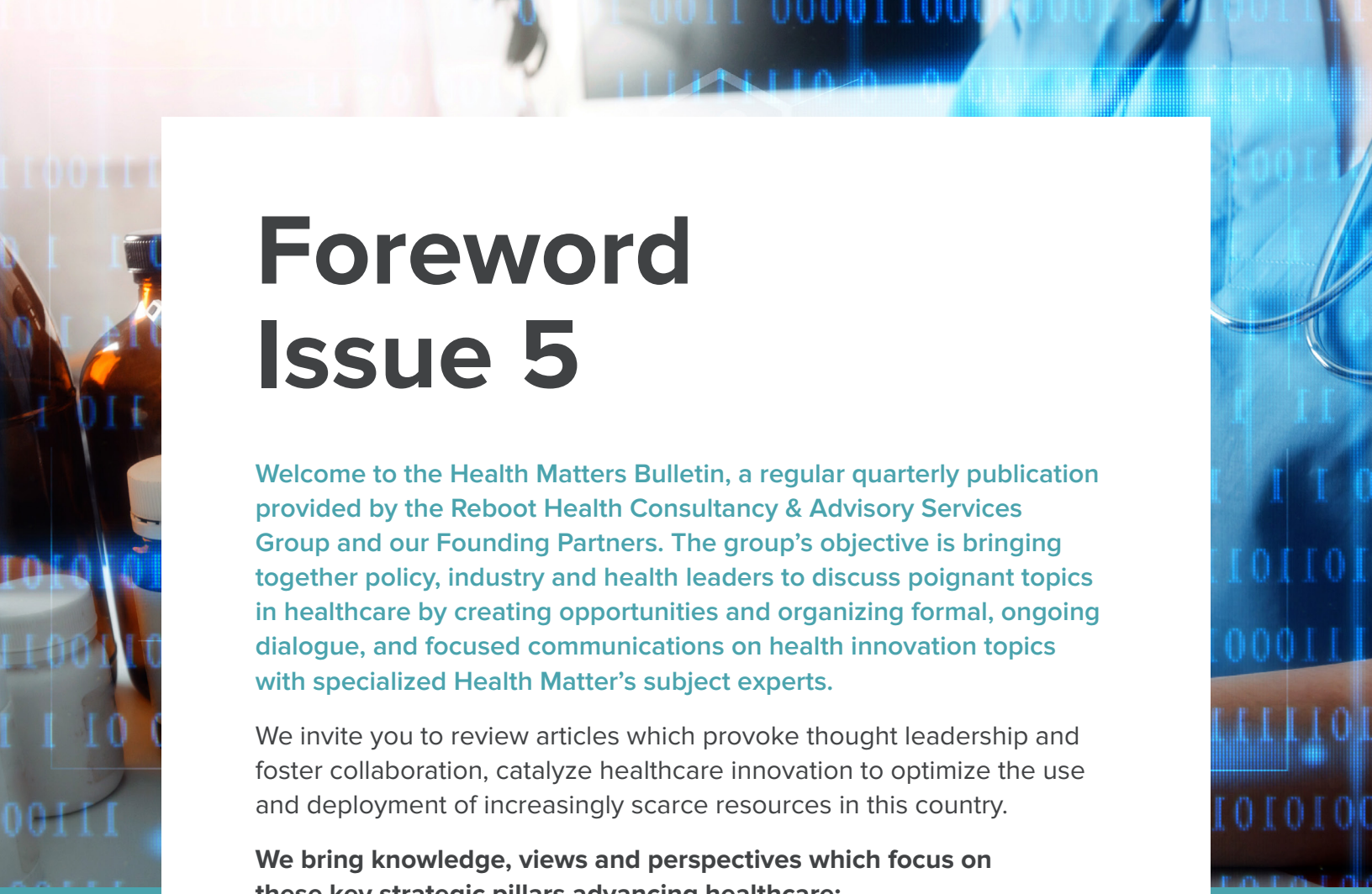
WITH FOUNDING PARTNERS: ROCHE AND CERNER

Community Pharmacy Anticoagulation Management Service (CPAMS)

Perspectives from the Closing Panel (HCS 2022)
– Implementing Innovation Now

reboot
HEALTH CONSULTANCY & ADVISORY SERVICES INC

INFO@REBOOTHEALTHCONSULTANCY.CA



Foreword Issue 5

Welcome to the Health Matters Bulletin, a regular quarterly publication provided by the Reboot Health Consultancy & Advisory Services Group and our Founding Partners. The group's objective is bringing together policy, industry and health leaders to discuss poignant topics in healthcare by creating opportunities and organizing formal, ongoing dialogue, and focused communications on health innovation topics with specialized Health Matter's subject experts.

We invite you to review articles which provoke thought leadership and foster collaboration, catalyze healthcare innovation to optimize the use and deployment of increasingly scarce resources in this country.

We bring knowledge, views and perspectives which focus on these key strategic pillars advancing healthcare:

OUR KEY STRATEGIC PILLARS

- **Health Data Privacy, Policy and Security**
- **Personalized Medicine and Genomics**
- **Artificial Intelligence in Healthcare**
- **Value Based Healthcare, Operational Efficiency and Health Policy**
- **Health Innovation Development**

Editors: **Alan Low | Greg Spievak | Howard Waldner**
Reboot Health Consultancy and Advisory Services Inc.

Acknowledgments

ARTICLE
11

Community Pharmacy Anticoagulation Management Service (CPAMS)

By: Dr. Murray Trusler | *BA, MD, MBA, FCFP, FRRMS*
President, INR Online Canada Limited

ARTICLE
12

Perspectives from the Closing Panel (HCS 2022) – Implementing Innovation Now

By: Dr. Rob Fraser | *PhD*
CEO, Molecular You

11

Community Pharmacy Anticoagulation Management Service (CPAMS)

WARFARIN

Warfarin is an oral anticoagulant requiring periodic dose adjustments. The dose is adjusted in accordance with the patient's degree of anticoagulation which is measured by a blood test, the prothrombin time/international normalized ratio or INR.

For patients with nonvalvular atrial fibrillation (NVAF), the target INR is 2.5 +/- 0.5 units. The proportion of time that the INR is within therapeutic range (TTR) is the standard measure of the quality of INR control.[1]

THE PROBLEM WITH USUAL (STANDARD) CARE

In Canada, warfarin is typically managed by primary care physicians using the usual care model of warfarin management (laboratory INRs and physicians determine warfarin doses). It is our universally government funded warfarin management system. The usual care **average TTR is 54% - 55%.**[2,3,4,5]

TTR SENSITIVITY ANALYSIS

H. D. White and colleagues[6] published a sensitivity analysis of the warfarin data from Sportif III and V. The warfarin control arms of the two trials were divided into 3 equal groups: good control TTR>75%, moderate control 60% - 75%, and poor control <60% (Table 1). **Good vs. poor control cuts the relative risk of stroke or systemic embolism, myocardial infarction, major bleeding and death by half.**

Table 1

Ischemic Events per 100 Patient-Years and Bleeding According to International Normalized Ratio Control

Ischemic Event	Poor Control Group *TTR <60%*	P Value	Moderate Control Group *TTR 60% - 75%*	Relative Risk Reduction Moderate	P Value	Good Control Group *TTR >75%*	Relative Risk Reduction Good vs.	P Value
	(n = 1190)	*(Poor vs Good)*	*(n = 1207)*	*vs. Poor Control*	*(Mod. vs Poor)*	*(n = 1190)*	*Poor Control*	*(Good vs Mod.)*
Stroke or systemic embolism	2.1	0.02	1.34	36%	0.09	1.07	49%	0.48
Myocardial infarction	1.38	0.04	0.89	36%	0.22	0.62	55%	0.35
Major bleeding	3.85	<.01	1.96	49%	<.01	1.58	59%	0.38
Death, all cause	4.2	<.01	1.84	56%	<.01	1.69	60%	0.74

With permission: Prof. Harvey White, Director of the Green Lane Cardiovascular Research Unit, Auckland City Hospital, Auckland, New Zealand.

DOAC TO WARFARIN RANDOMIZED CONTROLLED TRIALS 2010 - 2011

The direct oral anticoagulant (DOAC) randomized controlled trials (RCTs)[7,8,9] were designed to show that the DOACs were non-inferior to warfarin. The initial three RCTs (RE-LY [dabigatran], Rocket AF [rivaroxaban] and Aristotle [apixaban]) demonstrated the DOACs' non-inferiority to warfarin at an average **TTR of 60.3%**.

DOAC TO WARFARIN CANADIAN REAL WORLD OBSERVATIONAL STUDY 2020

A recent, large Canadian observational study[10] of real world data from seven provinces, compared three DOACs (dabigatran, rivaroxaban, apixaban) to warfarin (Table 2). **There has been no clinical outcome improvement with the use of DOACs vs. warfarin.**

Table 2

Event	Warfarin n=128,273	DOACs n=128,273
Stroke or systemic embolism*	2694	2732
Myocardial infarction	1551	1798
Major bleeding**	9023	9358

**Composite of stroke or systemic embolization and intracranial hemorrhage.*
***Composite of intracranial bleeding, gastrointestinal bleeding, ocular bleeding and other bleeding causing emergency room visits or hospitalizations.*

COMMUNITY PHARMACY ANTICOAGULATION MANAGEMENT SERVICE (CPAMS)[11,12]

CPAMS is a new warfarin management system that enables pharmacists, with supplementary training in warfarin management, to manage patients on warfarin using point of care testing and decision support software. Warfarin control is assessed by calculating each patient's TTR. One hundred and sixty pharmacies provide the service in New Zealand. The TTR for CPAMS patients with NVAF, in over five million days on treatment, is 75% (Table 3). These findings were verified in a Nova Scotia study (2018 - 2019)[13,14] using CPAMS in 40 pharmacies, which also achieved an **average TTR of 75%** in patients with NVAF.

Table 3

INR Range 2.0 - 3.0 "CPAMS at 10" data – Dr. Paul Harper, NZ[12]

Atrial Fibrillation	Number of Tests	Target INR	Days on Treatment	TTR
	296,247	2.5	5,877,180	75%

INCREMENTAL COSTS OF CPAMS VS. USUAL CARE IN BRITISH COLUMBIA *(CASE EXAMPLE)*

Tables 4 and 5 compare the costs of continuing the usual care model vs. the costs of CPAMS in a 30 patient program.

Table 4

Usual Care Costs (Fee for Service) 2021 MSC Fee Schedule per Month

Variable Costs to MOH	Price	INR Tests/Mo	Total	30 Patients
Lab INR[15]	12.07	1.4	16.90	506.94
Telephone advice[16]	6.98	1.4	9.77	293.16
Total				**$800.10**

Table 5

CPAMS Costs per Month

Variable Costs to MOH	Price	INR Tests/Mo	Total	30 Patients
Test Strips[17]	6.99	1.4	9.79	293.58
Decision Support Software[18]	2.50	1.4	3.50	105.00
Labour Cost $50/hr*	8.33	1.4	11.66	349.80
Fixed Costs to MOH	**5 Year Amortization**			
INR POCT device[17]	2,000		33.33	33.33
MOAT Training[19]	1,125		18.75	18.75
Total				**$800.46**

**Labour costs of a pharmacist*

Switching from usual care warfarin management to CPAMS is cost neutral – and offers significant benefits to both patients and already overburdened physicians. In addition this proposed change will deliver very significant cost savings to our healthcare system that will be achieved from the 50% reduction in the number of preventable major clinical adverse events.

CPAMS provides patients with a vastly more convenient mode of care. A pharmacy visit provides improved access to care (many pharmacies are open 7 days a week and provide evening hours as well), plus free parking, a 10 minute visit that includes INR testing and warfarin dosage recommendations as well as in person contact with a trained healthcare practitioner versus a trip to the lab and a phone call at some later time or date from the doctor's office with a warfarin dose. Usual care often fails to include vital clinical questions concerning: missed doses of warfarin, bleeding, changes in diet and medications, intercurrent illness, visits to the hospital and alcohol consumption. Point of care testing, a finger prick drop of blood, is vastly preferable to an often painful venipuncture and test tube blood draw. Usual care does not calculate a TTR which is a significant omission, because without the TTR there is no practical method of measuring the QUALITY of warfarin management. It's akin to managing diabetes without measuring a HbA1c.

Treatment data on the use of DOACs does not demonstrate a reduced incidence of stroke in patients with atrial fibrillation compared to usual care warfarin management[10]. The DOACs are fixed dose anticoagulants. However, warfarin is a variable dose anticoagulant, personalized to the patients needs. By fine tuning the dose of warfarin, achieving improved TTR, we can further reduce the incidence of stroke. The quality of our management at each patient visit can be measured and monitored by calculating the TTR using INR Online's software. On average using CPAMS improves the TTR by 20% compared to usual care resulting in not only significantly fewer strokes, but also fewer systemic embolisms, fewer major hemorrhages, fewer myocardial infarctions and fewer deaths compared to usual care warfarin management. Pharmacists, such as Alan Low, the Bulletin Editor, have expressed their willingness and ability to take on new services and responsibilities to help patients and ease pressures on primary care physicians.

CONCLUSION

Our healthcare system is overburdened. Primary care is in crisis. 900,000 British Columbians do not have a family doctor.[20] Hospital emergencies are overloaded. Inpatient beds are blocked. Healthcare costs are spiraling. CPAMS is a program that can help address this crisis by offloading the burden of warfarin management from physicians and hospital laboratories to community pharmacies. Pharmacies are not only accessible, they are in almost every community. They offer trained professionals with state of the art point of care technology and expanded service access. CPAMS is a cost effective, collaborative model of patient care with superior clinical outcomes and patient safety compared to usual care warfarin management and DOAC oral anticoagulation.

By: Dr. Murray Trusler | ***BA, MD, MBA, FCFP, FRRMS*** | *President, INR Online Canada Limited*

inronline.ca@hotmail.com

INR Online Canada Ltd. is a Canadian owned company providing the cornerstone decision support software program (INR Online) to pharmacists engaged in the Community Pharmacy Anticoagulation Management Service (CPAMS) since 2011. INR Online is essential for CPAMS in the provision of improved clinical outcomes, greater patient safety, significant healthcare system savings, a searchable clinical database and quality of care tracking functions. **www.inronline.ca**.

References:

[1] *Rosendaal FR, Cannegieter SC, van der Meer FJ, Briet E. A method to determine the optimal intensity of oral anticoagulant therapy. Thromb. Haemost. 1993 Mar1;69(3):236--9.*

[2] *Oldgren J, Healey JS, Ezekowitz, M, et al. Variations in cause and management of atrial fibrillation in a prospective registry of 15,400 emergency department patients in 46 countries. The RE-LY atrial fibrillation registry. Circulation 2014;129:1568-1576.*

[3] *Verhovsek M, Motlagh B, Crowther M, et al. Quality of anticoagulation and use of warfarin-interacting medications in long-term care: A chart review. BMC Geriatrics July 3, 2008, 8:13 doi:10.1186/1471-2318-8-13.*

[4] *Harper P, McMichael I, Griffiths D, et al. The community-based pharmacy anticoagulation management service achieves a consistently high standard of anticoagulation care. NZMJ 25 September 2015, Vol. 128 Number 1422. ISSN 1175-8716.*

[5] *Baker WL, Cios DA, Sander SD, et al. Meta-Analysis to Assess the Quality of Warfarin Control in Atrial Fibrillation Patients in the United States. Journal of Managed Care Pharmacy, 2009 Apr;15(3):244-252.*

[6] *White H.D., Gruber M., Feyzi J. et al. Arch. Int. Med. Vol 167 Feb 12, 2007. Results from Sportif III and Sportif V.*

[7] *Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. N Engl J Med 2009;361:1139-1151.*

[8] *Patel MR, Mahaffey KW, Garg J, et al. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. N Engl J Med 2011;365:883-891.*

[9] *Granger CB, Alexander JH, McMurray JJ, et al. Apixaban versus warfarin in patients with atrial fibrillation. N Engl J Med 2011;365:981-992.*

[10] *Durand M., Schnitzer M., Pang M., et al for the Canadian Network for Observational Drug Effect Studies Investigators. Comparative effectiveness and safety of direct oral anticoagulants versus vitamin K antagonists in nonvalvular atrial fibrillation: a Canadian multicentre observational cohort study. CMAJ Open doi: 10.9778/cmajo.20200055 cmajo December 18, 2020 vol. 8 no. 4 E877-E886.*

[11] *Harrison J, Shaw JP, Harrison JE. Anticoagulation management by community pharmacists in New Zealand: an evaluation of a collaborative model in primary care. International Journal of Pharmacy Practice, Volume 23, Issue 3, September 23, 2014.*

[12] *http://inronline.net/wp-content/uploads/2020/05/CPAMS-at-10.pdf CPAMS at 10 Report.*

[13] *https://pans.ns.ca/cpams PANS website reports: CPAMS Final Evaluation Report.*

[14] *Healthcare Management Forum 1-6. 2020 The Canadian College of Health Leaders. DOI: 10.1177/0840470420969444.*

[15] *British Columbia Ministry of Health, Schedule of Fees for the Laboratory Outpatient, Payment Schedule.*

[16] *British Columbia Ministry of Health, Medical Services Commission, Payment Schedule, May 1, 2020.*

[17] *https://www.rochecanada.com/en/products/diagnostics-products/point-of-care/coagulation-testing.html*

[18] *https://www.inronline.ca*

[19] *https://pd.uwaterloo.ca/PharmacyOverview.aspx*

[20] *https://www.theglobeandmail.com/canada/british-columbia/article-nearly-900000-british-columbians-dont-have-a-family-doctor-leaving/*

12

Perspectives from the Closing Panel (HCS 2022)

– Implementing Innovation Now

THE 22ND ANNUAL HEALTHCARE SUMMIT (HCS)
– SEPTEMBER 22 -23, 2022 VANCOUVER, BC, CANADA

Theme: Where the Rubber Hits the Road: Implementing Innovation and Access for Patients

The Healthcare Summit brought together over 50 national and international subject matter experts and leaders in digital health technology, personalized medicine, health innovation, value-based healthcare and genomics. Keynote speakers, panelists, and moderators had provocative discussions while they educated a diverse audience to foster transformational change in healthcare.

These are the perspectives and takeaway points presented by the closing panel led by:

Moderator: Dr. Robert Fraser | *President and CEO – Molecular You*

Panelists:

- Thea Discepola | *Vice President, Value Access & New Product Planning – Novartis Pharmaceuticals*
- Craig Ivany | *Chief Provincial Diagnostics Officer – Provincial Health Services Authority*
- Dr. Evgueni Loukipoudis | *Chief Technology Officer – Circle Innovation*
- Tim Murphy | *Vice President, Health – Alberta Innovates*
- Dr. Durhane Wong-Rieger | *President & CEO – Canadian Organization for Rare Disorders*

The COVID-19 pandemic highlighted the many challenges Canada's health system faces, and the additional stress of the pandemic on resources and personnel have led to a further deterioration of a system already in trouble. In short, Canada's healthcare system is in a crisis. Much of this is our own making as the reverence we give our system has left it unassailable and resistant to change. The pandemic forced modernization and innovation like never before. Yet despite these advances, the system is witnessing reversals and returns to past practices. This is a mistake. Now is the time to embrace the modernization and innovation we implemented during the COVID-19 pandemic and push it to new heights of efficiency, access, and value-based care for patients. It is time to take the pressures off our Healthcare Practitioners (HCP) workforce and implement preventive care and empower individuals to take responsibility for their health. It is the time to democratize and analyze data from healthcare systems and wellness practices to find ever greater efficiencies and effective care pathways.

THE RIGHT MINDSET

For the implementation of innovative technologies and approaches to healthcare, there is a need to adopt the right frame of mind. Keynote speaker Andre Picard summed it up well “We do not have an absence of ideas – we have an absence of courage”. Innovation in health is not just about technology and new devices. For it to flourish and achieve value in Canada the focus must be on “mindset, skillset, and toolset,” [HCS panelist Sue Paish]. There needs to be strategic trusting collaborations between industry, practitioners and healthcare systems for meaningful progress to be implemented. Procurement by health systems to implement innovative solutions will accelerate needed reforms. Time is short. Health systems are in a crisis now! Canada must make pace a priority and implement change rapidly. No one entity can figure it out alone. It is time to sit down together and figure it out, now.

HUMAN RESOURCE CHALLENGES IN HEALTHCARE

One in three clinicians are considering leaving their current role and as many as half of this group are considering leaving healthcare entirely. In the US there are approximately 3 million practicing nurses. It is estimated that 500,000 of them are leaving the profession within two years. Understaffed emergency rooms are leading to temporary closures across Canada, which the math tells us is about to get worse before it gets better. New programs in nursing to accelerate training and increase practitioners lack willing students. A career that was once heralded as a calling is now, thanks to over zealous anti-vaccination protestors, shouting “stay away”. Healthcare stakeholders need to first retain existing workers and evolve the systems and mindset towards effective systems of workforces that are team oriented, reward success and set out careers for future successes. The scope of practice of existing workers needs to be expanded and optimized to relieve physicians of care activities that can be handled by the already well-trained practitioners (e.g. pharmacists can prescribe drugs for minor ailments). Leverage the power of proven technologies like video- and telemedicine that reduce wait times and make practitioners’ life/work more balanced. Implement pharmacogenomics into primary care to improve the accuracy of prescribing, improve outcomes, reduce adverse drug reactions, reduce ER visits and lower costs of care by $billions/year. Canada is a true laggard (last or second last in OECD members) in the adoption of health technology to assist practitioners to be more efficient. Modernization of Primary Care Clinics can help free up physicians time to be spent on patients rather than administration.

Eighty percent of health spending is on managing chronic disease. Eighty percent of chronic disease is preventable. Stakeholders need to engage in partnerships with employers to implement preventive health programs that empower employees to take control of their health and keep them from developing chronic disease and out of “sick” care. The use of digital technologies and services can provide high quality, safe, effective and sustainable healthcare for citizens if we place them at the centre: *personalized health solutions.*

DRIVE HEALTHCARE INNOVATION WITH ADVANCED DATA ANALYTICS

The use of data in healthcare to solve our greatest challenges is at an inflection point. The pandemic has shown healthcare systems around the world the immediacy in needing accurate and timely data access and analytics to make life saving choices. As we emerge from the pandemic, even greater opportunities are growing, there is realization that much more can be done with existing health and wellness data, including harnessing the benefits of artificial intelligence (AI) and realize its true lifesaving and cost saving potential. During a pandemic, certain allowances have been made to make these lifesaving decisions. Post-pandemic, greater attention needs to be given to maintain individual privacy. Only the individual, or data owner can grant consent for the use or access of health and wellness data assets. Jurisdictions around the world need to work towards giving everyone a simple, intuitive way to see their health data that they control and can grant and/or rescind the right to use data elements for a specific purpose/time, so that everyone can benefit from the value created by data-driven insights and actions. Canada can learn from how the UK healthcare system has accelerated their digital journey, connecting their system through a common data platform that enabled cutting edge AI technologies to be implemented to deliver key insights into better therapeutic delivery processes.

DELIVERING ON THE PROMISE OF PERSONALIZED CARE AND MEDICINE

The promise of personalized medicine will be realized only with patient access to innovative diagnostics and targeted therapeutics. This profound change to preventive, personalized medicine will happen outside the established medical establishment. Like many innovations, it will be led by individuals taking advantage of emerging and proven technologies that provide detailed molecular analyses and personalized actions to prevent the onset of diseases they are trending towards. Molecular analyses that include genetic, proteomic, metabolomic, environmental and microbiomic analysis among others will provide the precise assessment of an individual's health status. Interventions will come in four stages as each stage of personalized, preventive intervention approach loses its effectiveness; *1. Diet, and 2. Exercise prescriptions, 3. Targeted supplements and 4. Genetic therapy.* Every patient will receive molecular analytics so their condition can be best understood and treated with the best therapy suited to the patient, not the disease. Patients with rare disorders will benefit from a deeper understanding of their conditions and a more precise approach to the therapy.

By: Dr. Rob Fraser | *PhD* | *CEO, Molecular You*

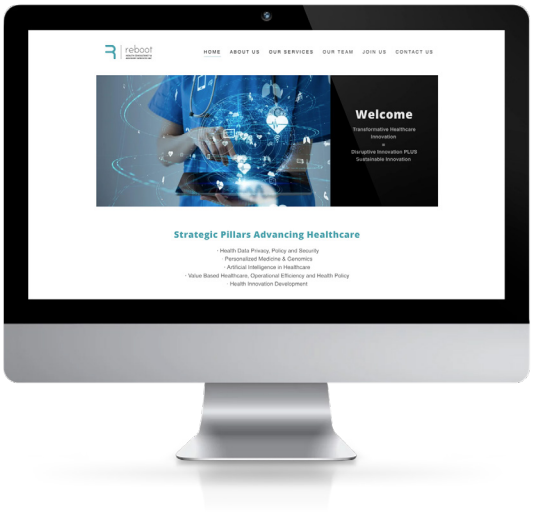
rob.fraser@molecularyou.com

Molecular You allows organizations to assess and guide their people to better health, while providing individuals with unparalleled insight into their chronic disease risks. Based on a new type of blood test we can assess hundreds of biomarkers and translate the results into targeted lifestyle interventions, delivered through our easy-to-use digital platform. For more information, please visit. **www.molecularyou.com**.

Copyright

ISSUE 5 EBOOK EDITION | *OCTOBER, 2022*

***Editors:* Alan Low | Greg Spievak | Howard Waldner**
Reboot Health Consultancy and Advisory Services Inc.



FIND OUT MORE & SUBSCRIBE

For more information or to subscribe and receive the ***Reboot Health Matters Bulletin*** regularly, email **info@reboothealthconsultancy.ca**.