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And More ...
Goodbye Yesterday.
Hello Tomorrow!

MEDICAL RECORDS AT THE SPEED OF NOW!

Contact Stuart Levy
stuart.levy@parameds.com
718-575-2000 x2769
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hr | ReFlex, Hannover Re’s automated/digital underwriting platform, is designed to enhance a company’s ability to make the most accurate and timely risk assessment decisions at the point of sale. Using third-party data such as Rx, MIB, MVR and predictive models, it supports accelerated underwriting, simplified issue and fully underwritten products. Underwriting question sets and rules are transparent and customizable for easy integration with clients’ current processes. With an open and modern architecture, hr | ReFlex remains flexible to evolve with new underwriting paradigms.

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THE UNDERWRITING QUIZ

FALU Club of RGA

1. All of the following are schedule 1 drugs EXCEPT:
   a) Heroin
   b) Marijuana
   c) LSD
   d) Opium

2. The main functions of the kidneys include all of the following EXCEPT:
   a) Secretion of renin
   b) Secretion of erythropoetin
   c) Formation of urine
   d) Activation of vitamin A

3. A type of climbing where a rope is attached to a climber at one end, passes through an anchor at the top of the route, and back down to the partner at the other end is called:
   a) Bouldering
   b) Top roping
   c) Ice climbing
   d) Aid climbing

4. Which of the following descriptions of tumors are most likely to indicate malignancy?
   1) Poorly differentiated cells
   2) Lack of defined border
   3) Slow growing
   4) Fast mitotic rate
   a) 1, 2, 3
   b) 2, 3, 4
   c) 1, 2, 4
   d) All of the above

5. Quota share reinsurance is a type of facultative reinsurance whereby the direct company will keep a fixed percentage (less than its full retention) of every case and cede the balance to the reinsurer.
   a) True
   b) False

Executive Summary  ON THE RISK is known for its scholarly articles on insurance topics. In keeping with this, the FALU Club of RGA offers a fun and challenging addition to OTR in the form of the underwriting quiz. This regular feature is meant to challenge the underwriting knowledge of you, the reader, encourage ALU class enrollment and promote ongoing professional education in general. If you would like to submit quiz questions of your own, or if you have any comments, suggestions or questions, please contact the FALU Club of RGA at RGAFALUClub@rgare.com. We look forward to hearing from you.

So now we invite you to test your wits on this quiz. Are you smarter than a FALU?

Answers on page 77
Financial underwriting tools from LexisNexis® can give you the critical information you need to evaluate risk and independently confirm financial-related information disclosed on life insurance applications within minutes.

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For more information, call 800.458.9197 or visit lexisnexis.com/risk/life
As we head into spring, be sure to check out the calendar of coming events page for national and local conferences. If you know of a conference that is not listed, please let us know and we will add to the list to get the word out. Hope to see many of you in San Diego for the 2017 AHOU Annual Conference next month!

Is 2017 proving to be filled with emerging underwriting trends? How will this year shape up? This quarter you’ll see some great insight. In the article, “Bringing ADHD into Focus,” Dr. Michael Wetzel provides an understanding of the considerations for adults and children with attention deficit hyperactivity disorder. Also in medicine, while hemoglobin A1c has a history of proving useful for underwriters, Gary Mills sheds some light on factors that can influence either false-positive or false-negative A1c values in his article, “Examining the Reliability of Haemoglobin A1c in Assessing Risk.”

Check out Marv Reber’s leadership column this quarter where the focus is on underwriter empowerment in his article, “Less Is More.” Perhaps you have an idea for the leadership column? Contact Marv and you could be published!

We are always on the lookout for authors. Do you have a burning passion for a particular topic, a specific underwriting expertise, or are you on the cutting edge of the latest underwriting innovation? Perhaps you would like to elevate your visibility within the underwriting profession or at your company? Or maybe you’ve just always wanted to be a published author? Have confidence and take the next step! Go to www.ontherisk.com for a copy of the Author Guidelines and contact any member of the editorial staff to get started.

As always, if you have something to add regarding a recent article, event or trend, write a "Letter to the Editor."

Be sure to follow us on Twitter, Facebook and LinkedIn!

Nancy Atkins
2017 Editor-in-Chief

Contributing Editor Jane Mattson has completed her term of service. OTR thanks Jane for her dedication and her contributions to the underwriting profession.
Today you need powerful underwriting more than ever. You need AURA.

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E-mail askaura@rgare.com for a demonstration.
April 2 XIVth IUSG (International Underwriting Study Group) at the Marriott Marquis and Marina, San Diego, CA. For more information contact Rafael Shabetai at rshabetai@palig.com.

April 2-5 AHOU Annual Conference at the Marriott Marquis and Marina, San Diego, CA. For more information visit www.ahou.org.

April 5 FHOUA (Fraternal Home Office Underwriters Association) Annual Meeting at the Marriott Marquis and Marina, San Diego, CA. For more information visit the FHOUA web page at www.ahou.org.

April 18 ALU Annual Examination. For more information visit www.alu-web.com.

April 24-26 ACLI Life Insurance Conference 2017 at the Rosen Shingle Creek, Orlando, FL. For more information visit www.acli.com.

April 27 WAHLU (Wisconsin Association of Health and Life Underwriters) Spring Conference at the Sheraton Milwaukee Brookfield, Milwaukee, WI. For more information visit www.wahlu.org.

May 7-10 CLIMOA (Canadian Life Insurance Medical Officers Association) 72nd Annual Scientific Meeting at the Park Hyatt, Toronto, ON. For more information visit www.climoa.com.

June 4-6 CIU Annual General Meeting at the Ottawa Marriott Hotel, Ottawa, ON. For more information visit www.ciu.ca.

June 21-23 SEHOUA (Southeastern Home Office Underwriters Association) 45th Annual Conference at the Loews Don CeSar Hotel, St. Pete Beach, FL. For more information contact Jeremy Wesson at jwesson@sfbl.com.

June 25-28 NAHU (National Association of Health Underwriters) 2017 Annual Convention & Exhibition at the Renaissance Orlando at Seaworld, Orlando, FL. For more information visit www.nahu.org.

July 30-August 1 SOA (Society of Actuaries) Fifth Annual Underwriting Issues and Innovation Seminar in Chicago, IL. For more information visit www.soa.org/2017underwritingseminar.

September 20-22 MUC (Midwestern Underwriting Conference) at the Louisville Marriott Downtown, Louisville, KY. For more information visit www.midwesternunderwritingconference.com.


October 4-6 TWUC (Texas Wide Underwriting Conference) at the South Shore Hotel and Resort, League City, Texas. For more information visit www.twuc.org.

October 8-10 ACLI Annual Conference 2017 at the Loews Sapphire Falls Resort, Orlando, FL. For more information visit www.acli.com.

October 13 NEHOUA (Northeast Home Office Underwriters Association) Annual Conference at the Harborside Sheraton, Portsmouth, NH. For more information visit www.nehoua.org.

October 15-18 SOA (Society of Actuaries) Annual Meeting and Exhibit to be held in Boston, MA. For more information visit www.soa.org.

October 15-18 AAIM (American Academy of Insurance Medicine) 126th Annual Meeting at the Westin Buckhead Atlanta in Atlanta, GA. For more information visit www.aaimedicine.org.
Together, we see risk clearly.

MIB sheds light on fraud so that members can offer — and consumers can purchase — affordable life and health insurance. With products like the MIB Checking Service, Plan-F Follow-up Service, Insurance Activity Index and the Disability Income Record Service, we help improve underwriting effectiveness and profitability. Exactly what the industry needs to…issue with confidence.
“The Future in Focus”
As we enter into the first quarter of 2017, the Canadian Institute of Underwriters reaffirms our association’s commitment to deliver the best education content to our membership and industry partners. Our CIU Executive Committee’s mission for this year is to raise that bar even further. Foremost, together we need to hone our professional skills, as we continue to Connect, Educate and Elevate all CIU underwriting members through the commitment to education.

The year 2016 was an eventful one, presenting great challenges and opportunities for the Canadian insurance industry. Underwriters rose to these challenges in a way that made me proud to be among their number. The CIU Executive Committee commits to presenting programs that prepare our members to address the inevitable future changes the industry will face.

We were especially pleased with our October webinar on “Medical Marijuana.” Despite some technical glitches, we had over 400 participants join the session, so many more than we have ever been able to engage in a single education event. Due to the success of this event, part of our future offerings will include webinar presentations.

By the time this article appears, the CIU will have hosted the first of 2017’s annual events. CIU’s Winter Education Seminar covered a wide range of cutting-edge topics of vital interest to underwriters today. Presented in January and geared toward all levels of underwriters, our industry speakers zeroed in on the long-term impacts of childhood obesity, LVH as it relates to underwriting the athletic heart, hereditary cancer syndromes, and the many and varied implications of chronic pain. They also heard presentations on how best to utilize the resources of our medical directors, underwriting living benefits, specific risks of travel, and underwriting new immigrants. Highlighting the great opportunities and our potential, we gained career and personal insights into the forces and experiences shaping who we are as underwriters, and helping us to define our future paths in the underwriting field.

We thank our many industry and corporate partners for their foundational assistance. With their support CIU looks to the future, enabled to engage the best speakers, host outstanding education events, and even dip our toes into webinar development of future presentations.

On behalf of our members, I would also like to thank the many volunteers who serve on the CIU Executive and Program Committees, for their dedication to our industry and their commitment to making this all possible.

Several years ago, a number of industry leaders came together to discuss and define the many components of an underwriter and the tenets of the underwriting profession, and they were incorporated into a document entitled the “Guiding Principles for the Underwriter.” Immersed as we are in a culture of rapid change and environments filled with daily challenges, one of the outstanding points of our Guiding
Millennials: Born between 1980 and 2000 and now the largest generation in Canada, they are disrupting all aspects of our world: How we work, how we communicate, how we consume, and our politics. David Coletto, Canada’s foremost expert on Millennials shares his insights from his unique perspective, telling us what makes his generation tick, why they are different from other generations … And what it means for underwriters and the broader insurance sector. Don’t miss his dynamic presentation … come learn what all the fuss is about!

Dr. Blair Feltmate
University of Waterloo
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AND ITS IMPACT ON
OUR HEALTH

Karen Cutler
Manulife
INSIGHTS INTO
LEADING CHANGE
IN UNDERWRITING

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Principles has never become so important as it is today ... and these words are words to live by:

"Maintain the dignity and sound reputation of the underwriting profession."

These words will guide CIU through 2017, and beyond, giving our association and our leadership a well-defined chart with a focused, steady course through the winds of change.

Throughout 2017, CIU is committed to bringing the best in education and networking to our growing membership as we Connect, Educate, Elevate. We are always open for business. Please connect with CIU’s Executive team via www.ciu.ca or LinkedIn. Tell us what moves you as an underwriter, and what you see in the industry that may be beneficial for CIU to implement.

On behalf of CIU’s Executive Team, I extend sincere thanks to you, our 850-plus strong CIU members who animate this association. You, and our member firms, provide us with fundamental support, via participation at our seminars and events, and also guidance through your diligent, highly valued feedback, as we plan for the future together.

This year will be a very special and joyful one for all Canadians as our country celebrates our 150th anniversary of confederation. It will also be a special year for the CIU, as we gather in Ottawa on June 5-6-7 to host CIU’s 2017 Annual General Meeting in our nation’s beautiful capital. The program will feature exceptional speakers and cutting-edge topics. Highlighted on our 2017 program are David Coletto, CEO of Abacus Data and Canadian Millennials; Dr. Blair Feltmate from the University of Waterloo, discussing climate change and its impacts on our health; Nick Durie on continuous education and Karen Cutler, VP & Chief Underwriter at Manulife, who will speak to us on leading change in underwriting. The program will also feature topics on HIV, challenges faced by brokers and mental health issues, and will also include some interactive case clinics.

Our invitation to CIU’s 2017 AGM includes resource and travel information for Ottawa, an online booking link to our host hotel, Ottawa’s Marriott located at 100 Kent Street, as well as preliminary CIU 2017 AGM program details, which can all be found at www.ciu.ca. Please plan to join us!

To quote Rick Mercer: “Be here for Canada’s big year.”

See you in Ottawa this June!

Chantal Gray
CIU Chair 2017
Stay competitive and lead your company into the next era of life underwriting with TransUnion’s TrueRisk® Life, a credit-based behavioral score that gives you a multidimensional view of an applicant’s risk. Backed by RGA, TrueRisk® Life is the next evolution in using data to enhance risk assessment and improve the customer experience. Whether you want improved risk selection or a clearer path to accelerated underwriting, TrueRisk® Life is the piece of evidence you need now to achieve your goals.
Texas-Wide Underwriting Conference Board of Director members who helped plan the 2016 conference were Liz Collier, NY Life (President); James Atkins, SCOR; Liz Biles, RGA; Paul Boudreau, Munich Re; Joy Davis, NY Life; Sharon Garner, ANICO; Keith Hoeffner, LexisNexis; Katy Luebke, USAA; Michelle Privett, Hannover Re; Richard Odom, National Life; Rebecca Rameriz, EMSI; Jill Thompson, Optimum Re; Laura Trout, ANICO; and Dee Velazquez, EMSI.

The TWUC Board is thrilled to announce the introduction of a new member to the team. Christina Baldwin from New York Life has recently joined the 2017 TWUC Board of Directors; she has a special interest in technology and has experience working for non-profit organizations. TWUC warmly welcomes her to the board.

TWUC wishes to recognize and thank our fantastic sponsors for the 2016 event; without them we would be unable to bring such valuable education to participants. TWUC has three levels of financial support, with our highest contributions from our Alamo sponsors, then our Lone Star sponsors, followed by the Bluebonnet sponsors.

EMSI Insurance continued its strong support of TWUC by remaining an Alamo sponsor. Lone Star sponsors were Canada Life Re, MIB, Munich Re and SCOR. Bluebonnet sponsors were American National Life Insurance Company, Clinical Reference Laboratory, Gen Re Life & Health, Hannover Re, LexisNexis, Milliman Intelliscript, National Life Group, New York Life, Optimum Re, Parameds.com, RGA, Swiss Re, Synodex and Transamerica. TWUC sends many thanks for its sponsors for their new and continued support.

Wednesday began in the usual TWUC fashion by starting off with networking opportunities while dining on a delicious lunch before attending a half-day of presentations. Dr. Gina Guzman from Munich Re began the conference by explaining how clinical research can be translated into underwriting mortality information. Scott Whitmore, PharmD, from Milliman Intelliscript discussed the always important topic of diabetes.

TWUC’s own Liz Collier finished the day by moderating a lively hot topics session that enjoyed active participation from the audience. Topics discussed included underwriting HIV-positive insureds or those taking Truvada, underwriting credit reports, underwriting marijuana, underwriting policy riders such as long term care, and underwriting Zika virus. Participants ended the day enjoying a networking reception that was heavily attended.

Charlotte Lee, MD, kicked off the TWUC full-day session providing education on echocardiograms. Colin DeForge from RGA followed with an interesting talk on the fundamentals of fraud; it was Colin’s first time presenting, and TWUC was happy to support him in his endeavor.

After lunch Dr. Paul Quartararo stimulated the group with conversation on various case scenarios in a presentation entitled “Underwriting Potpourri.” Monica
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Clink from Optimum Re followed up the earlier fraud talk by discussing complex death claims and going through case studies.

The rest of the afternoon was devoted to a chief underwriter panel moderated by TWUC’s own Keith Hoeffner. The chief panel was led by Bob Cicchi, AIG; Tom Gangemi, NY Life; Bill Moore, Munich Re; and Bill Wysong, Transamerica. A wide range of topics were discussed including the challenge of underwriting foreign nationals, developing areas of fraud, use of big data in underwriting and how underwriting is changing in today’s technological world, and addressing the changing demographics of underwriters.

Evening entertainment and heavy hors d’oeuvres were provided later that evening at Manny’s on the River, and once again, the event was well attended. A DJ, Rockin’ Rick, provided entertainment for the group with comedy, music and dancing.

The conference wrapped up on Friday with a group business meeting led by TWUC President Liz Collier. Approximately 15 people attended the business meeting, and the attendees provided great feedback to help make future TWUC events better.

The Texas-Wide Conference is open to all attendees in the United States, not just Texas. Any questions regarding attending the conference can be directed to Michelle Privett via work phone 720-279-5012 or by e-mail at michelle.privett@hlramerica.com, or to any board member listed. The conference is usually held in October of each year. Volunteers are always welcome no matter where they live geographically. Current board members for TWUC live in various regions of the country, not just in Texas.

All are invited to the Seventh Annual Texas-Wide Underwriting Conference to be held on the beautiful Texas Gulf Coast near Houston in League City, TX, October 4-6, 2017, at the South Shore Hotel and Resort.
Mark your calendars and plan to join us at the elegant Metropolitan Ballroom on Wednesday, April 26, 2017

Metropolitan Ballroom
5418 Wayzata Boulevard
Golden Valley, MN 55416

COST: Half day - $45,
Full day - $75

Registration deadline: Friday April 14, 2017

Program speakers, agenda, and registration will be available at www.tcahou.org by March 27, 2017
Executive Summary
This article takes a look at the value of allowing associates to lead and collaborate on decision making. A case study is presented to illustrate the impact of a change from a manager-led style to a more collaborative style on a long-standing practice of distributing work. Talking points follow that support this shift in leadership style, with emphasis on empowerment.

Introduction
Historically, managers had all the information and made all the decisions. In the past, managers received periodic reports on blue bar computer paper left at their desks by IT reporting. Associates implemented or acted upon the decisions of the managers. Managers now receive internet-based reports daily that can be configured in multiple ways. Reporting links can easily be shared with associates for discussion. Associates now have information similar to their managers, and being closer to the work, may be able to add valuable insight to the decision-making process.

Managers have a responsibility to lead their teams. One of the outdated management principles is command and control. Some managers may have a tendency to control things, to keep on track, to focus on strategy. Some managers may even feel that they need to make all the decisions; that this is a key responsibility of being a manager. Even new managers who don’t really know all the answers may feel it is their responsibility to make all the decisions, and at times, their teams expect it. But something done in excess may not always be the best solution. Eating too much chocolate comes to mind. The manager who controls everything may become known as a micromanager, certainly a pejorative. So a delicate balance exists between keeping everyone on track and being labeled as an overbearing micromanager. How might a manager find a common ground where the team performs at its highest level?

Interestingly, teams that are allowed to work through certain challenges on their own, or with managerial facilitation, often find greater success compared with strictly manager-led initiatives. This doesn’t mean managers are no longer of any use. Managers can become even more effective when they develop a manner of empowering a group of associates and collaborating with them to find the best solutions. Very simply, sometimes doing less is more.

A Case Study
New applications and mail arrived and was assigned to underwriters. Work was distributed equally but some underwriters were more efficient, while others struggled. Daily reports were created and distributed to managers showing how much work each underwriter had been given and how much each had completed. Managers might review the report. Sometimes work was reassigned to assist, other times not.

The daily reports were later provided to underwriters to review their team demands. They were now able see how much work was on everyone’s plate each day. However, medical records with 400 pages and simple responses to underwriter questions were categorized similarly. Underwriters could now approach the managers to ask for assistance, knowing how their workload fit in with that of team members.

The managers also had a morning meeting to determine whether their teams needed assistance, or were able to provide help to other teams. Senior managers often attended and made decisions regarding which teams would give or receive help. The managers then met with their teams to show them the work volumes and determine who would give or receive help. A manager might say, “You need help, you look good, you can provide help, you help her, you help him.” Underwriters waited anxiously to hear whether their names would be called. If not, they were home free.
SCOR LAUNCHES ITS NEW STRATEGIC PLAN

Thanks to its accelerated development in Life and P&C reinsurance, SCOR now belongs to the top tier of global reinsurers. The Group’s premium income will reach around EUR 13.7 billion in 2016, an increase of 34% since 2013. Shareholders’ equity reached EUR 6.3 billion at 30 June 2016, up 33% over the strategic plan, after the distribution of EUR 781 million in dividends. SCOR’s development has focused on the twofold objectives of profitability and solvency. All the targets of the “Optimal Dynamics” plan, which has come to an end, have been achieved. With the upgrade of its rating in 2015, SCOR is now rated AA−(1). Plan after plan, the SCOR group demonstrates its ability to find solutions to all the challenges posed by a difficult and shifting economic and financial environment. SCOR absorbs loss event shocks thanks to its active, state-of-the-art risk management policy. Today, SCOR launches its new three-year strategic plan, “Vision In Action,” which is fully aligned with “Optimal Dynamics.”

Over the next three years, SCOR will pursue its dynamic combination of growth, profitability and solvency with ambition and determination, serving its clients and benefitting its shareholders.

2016–2019 TARGETS

HIGH RETURN ON EQUITY

ROE ≥ 800 basis points above the five-year risk-free rate over the cycle (2)

OPTIMAL SOLVENCY RATIO

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(1) Standard & Poor’s and Fitch Ratings. (2) Based on a 5-year rolling average of 5-year risk-free rates. (3) Solvency Capital Requirement.
for the day. In addition, some underwriters feared asking for help as it might show a sign of weakness.

One day at the team meeting, the manager asked each underwriter to describe what his day looked like, even though the numbers were right there for everyone to see. On that first day some may have underestimated their capacity to work, fearing they might have to assist others, not being able to get their own work done. The manager continued this new process each day. After a while a pattern emerged where certain underwriters began articulating their situation quite well and regularly offering to help, or asking for help. The team began to realize that their morning meeting to review the work and shift resources was to meet both their personal needs and their customers’ needs. The team became more cohesive and more collaborative. Members trusted one another, gave honest assessments of their work, and had empathy for struggling teammates. As a whole, the team became much more successful than any one individual.

Rather than just completing their own work, underwriters now looked holistically at the entire team, not only from the absolute numbers standpoint, but also from an aging work standpoint. Work that was aging now became more important than some of their own work. The manager also began distributing new work more effectively, knowing underwriter capabilities in advance.

Noticing this change, the manager became less and less involved in the daily discussion. The manager became more of a facilitator or discussion leader. The underwriters seemed to know their work better than the manager ever had. A paradigm shift had occurred in how the team looked at their work, and they were better off for it.

Empower, not Power

- **Respect the knowledge of others.** People doing the actual work often have more knowledge than those who are not as close to the end customer. It is amazing how well someone can present an idea or describe his capacity to work, given the chance to do so.

- **Don’t worry about power.** Managers have information and that information often represents power. If managers were to share the information, would they lose power? This is a thought that managers have to get beyond. If managers can learn that associates can have as much information as them and even understand it better, the managers can rely on their associates to help make decisions.

- **Follow from the front.** The concept of “following from the front” refers to managers and business leaders whose roles shift away from purely managing and delegating people, to empowering them to shine and solve problems. It includes removing roadblocks and working with employees as a facilitator and team member.

- **Establish stretch goals, empower and stand back.** A great leadership trait is to inspire a team to achieve outstanding results, provide support, but then get out of the way of associates because they are able to solve problems on their own. One might think that this is common sense; however, many organizations continue to follow management styles that encourage command and control of all facets of the process.

- **Empower everyone.** Managers who empower their teams will now have more time freed up to set strategic direction and to stay in tune with their company and within their industry, which will help their teams to continuously improve. Employees are often better-equipped to remove obstacles and leverage their knowledge if only empowered. Let them give the answers rather being told the answers.

- **Embrace vulnerability.** Leaders can find success by letting go (notice the use of leader here vs. manager). This is sometimes a leap of faith. Leaders have to enable the team to run experiments, to learn and to innovate. They don’t need to be an expert at everything. The team knows many of the answers.

- **Be transparent.** Managers should be as transparent as possible. The more information that is communicated and pushed downward, the greater the involvement and the better the results.

- **Lead by example.** Rather than giving instructions to others, be the first to follow the new process. Model the new behavior and others will follow.

**Conclusion**

The traditional manager role has been changing for some time. The best managers are no longer those who make all the decisions. Managers who rely on the talents of the human resources around them will be more successful. Managers who are more facilitative, more collaborative and perhaps more humble will be the ones who find success. These are the true leaders.
Have you ever considered writing an article for OTR?

Do you need something extra for your Performance Review? Need to add to your Resume being published in a professional journal? Sharing your expertise and knowledge can help elevate your visibility in your profession.

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INTERVIEW WITH A LEADER: MARK COSTELLO

Mark Costello

Vice President, Living Benefits
Munich Re
mcostello@munichre.com

Executive Summary

Mark Costello, FSA, MAAA, is Vice President, Living Benefits at Munich Re with responsibility for the overall performance of the living benefits business. He has worked at Munich Re for 13 years in various roles—LTC pricing, life client manager and 5 years in his current role. He has also worked at Bankers Life & Casualty, Washington National, Pioneer Financial Services and Canada Life in product development roles working with major medical, life, annuity, critical illness and LTC insurance. He has 30 years of insurance industry experience. He graduated with a BS in Actuarial Science from the University of Illinois. He has a wife and two children.

OTR What was your very first job? What were some of your responsibilities? Did you learn any skills or lessons that you still use today?

MC My very first job was working at a place called Velvet Freeze. It was an ice cream and convenience store as well as a hangout for the local high school (with booths and video games). That is the first place I learned to work with the end-customer. The lessons I learned included how to try to put the customer first, how to deal with difficult customers, and even how to learn when to let go of customers (I had to call the police on a couple of rowdy teens). However, the lesson that probably stuck with me the most was work ethic. This was a franchise owned by a man with four small children and he poured his life into it. I would close the store 3 or 4 nights a week and count the day’s take. I saw first-hand the tangible results of his hard work, of my work and how keeping those customers happy impacted the financial bottom line.

OTR How did you first get into insurance?

MC There are two different stories. My version of the story is that I was a freshman at the University of Illinois and an actuary came into my Calculus class to talk about the actuarial profession. I left the class and went right home to call my father to tell him I knew what I wanted to do. Unfortunately, I have no idea who the visitor to the class was. (My father’s version of the story is that HE told me about being an actuary when I was in high school.)

OTR What was your favorite job in this industry?

MC My current job is my favorite job. First, I work for a great company that values its employees and has given me a literal world of opportunities. Second, I work with a great group of people who are accomplishing some pretty amazing things in a very challenging environment.

OTR Who is your role model, and why?

MC As corny as it sounds, my father is my role model. He taught me (and continues to teach me) to do the right thing. Period. He always knew (and knows) what the right thing was and he would do it or say it no matter the consequences.

OTR Were there any decisions you made in your career that you feel were mistakes? What did you learn from them?

MC Without naming names, there have been one or two times where I have made the “wrong” choice regarding jobs—whether the wrong company or the wrong role within a company. I’ve worked for six different companies in my career—all precipitated by a merger or acquisition of some type. I’ve ended up on the “losing” side and the “winning” side. I think that the most important lesson I’ve learned is
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- Growing Deployment of Straight-Through Processing Models
- Implications of Artificial Intelligence in Underwriting
- Merging Traditional and Emerging Risk Assessment Tools

The final program and other details will be announced soon.
that life happens and it doesn’t necessarily happen according to my long term plans. All that I can do is give everything I have to what I am currently doing and be open to what life brings me.

**OTR** Tell us about a project or accomplishment that you consider to be the most significant in your career.

**MC** We just worked together with a whole team of partners to release the first click-to-purchase disability product in the US. This involved so many different people and so many different organizations. The accomplishment is significant, first, because I believe it will be the key to providing valuable protection to the nearly 100 million people who need it, but don’t currently have that protection. It was also significant because of the hurdles overcome in producing something so radically new.

**OTR** What is your favorite vacation destination?

**MC** It may sound self-serving given my employer, but I love Munich and Bavaria—it’s a terrific combination of history and natural beauty with people that have a wonderful culture and outlook on life.

**OTR** Looking back, if you could have had any non-insurance-related career, what would it have been and why?

**MC** I always thought that I would be a teacher. As I’ve taught some kids’ Sunday school classes and tutored some kids in math, I still think I may do that someday.

**OTR** Tell me what you think is the most important leadership quality and why?

**MC** Leadership cannot exist unless there is a leader and there are also followers. Successful leadership requires that both leader and the people being led accomplish some goal. When things get tough, will the team go to battle with the leader to accomplish that goal? To me, the most important quality of a leader is trustworthiness. The team must trust that the leader is competent, is going in the right direction, will do the right thing, and has their interest at heart. I know that, if I trust my leader in these regards, I will do whatever it takes for him or her.

**OTR** What advice would you give someone just starting out in a leadership position?

**MC** My advice to anyone in any position is to treat every day, every moment, every interaction as a job interview—giving your absolute best at all times to deliver the absolute best results. Regarding leadership,

» First, take the time to understand the scope, constraints and objectives.

» Make sure to get to know and understand your team. What are their individual—and collective—strengths and weaknesses?

» Learn what a leader is. Read a book. Get advice from a mentor—whether in the business or not. Don’t get paralyzed getting information, but make sure you understand what the difference is between a leader and your current role.

» Map out a clear vision of what you and the team are going to accomplish in the short (90 days), medium (1 year) and long term (3-5 years).

» Remember where you came from. What did you value in a leader? How did you want your leaders to act? What was it you’ve been doing that got you to this point?

» Within the scope you’ve been given, take ownership and just get started. Keep in mind the vision you’ve set and get started.

✓ Never stop learning. Keep getting input—from your team, from a mentor, from books.

✓ Respond and revise as appropriate. You will make mistakes. Someone on your team will make a mistake. Or, some outside force will act upon you. Learn from it and move one.

✓ Give your team the tools and support they need and let them do their jobs.

✓ Celebrate victories along the way. Recognize your team and give credit.

---

**OTR** For fun, let’s try some quick-fire questions. Cat or dog?

**MC** Dog

**OTR** Avengers or X-Men?

**MC** X-Men (ask my wife about the boxes of comic books in our storage room)

**OTR** Filet or salmon?

**MC** Filet

**OTR** Country or city?

**MC** City

**OTR** Book or e-book?

**MC** E-book

**OTR** Oceans or mountains?

**MC** Mountains for sure

**OTR** Cake or pie?

**MC** Both, right?

**OTR** Amusement park or day at the beach?

**MC** Amusement park

**OTR** Football or basketball?

**MC** Football

**OTR** Phone call or text?

**MC** Text

**OTR** Ferris wheel or roller coaster?

**MC** Roller coaster
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The usual red blood cell (RBC) volume is approximately 80-100 fl. However, the size can vary significantly. Heterogeneity of cell volume is known as anisocytosis. The degree of anisocytosis or size variability is quantified by the red cell distribution width or RDW. The RDW equals the coefficient of variation of the mean corpuscular volume (MCV). The actual formula for calculating the RDW is the standard of deviation (SD) of the red blood cell volume divided by the MCV. The RDW is routinely calculated by virtually all automated hematologic analyzers, so the values are reported for almost every complete blood count (CBC). The results are usually expressed as a percentage with the usual upper limit of normal in the 14.5% to 15.0% range.

Several factors may affect RDW values. Erythropoietin, a hormone that regulates the production, maturation and survival of red blood cells, is one of these. Low levels of erythropoietin or resistance to its effects may increase the RDW. There is no significant difference in RDW by gender but values do gradually increase with age. Race is also a factor and individuals of black race have higher readings. There is also a modest increase with strenuous exercise. Pregnancy may affect the RDW but the data supporting this is mixed.

One thing to remember is that, while the RDW is routinely calculated by virtually all automated hematologic analyzers, the actual methodology used by those machines differs somewhat. As a result it is, to some degree, difficult to strictly compare the values generated by different analyzers. This is one reason why the normal range may vary from lab to lab.

The RDW is increased by conditions that modify the shape of the RBCs, i.e., those that lead to ineffective production or increased destruction of red cells. Traditionally, the RDW has been used in combination with the MCV in the assessment of anemia. For example, conditions with a normal RDW and low, normal and high MCV would include (among others) thalassemia minor, acute blood loss and chronic liver disease, respectively. On the other hand, anemias with a high RDW and low, normal and high MCV would include (among others) iron-deficiency anemia, sickle cell anemia and vitamin B12 or folate deficiency, respectively. Of these situations the one most commonly seen in underwriting is using the RDW to separate iron deficiency from thalassemia minor in applicants with anemia and a low MCV.

However, the RDW has a much broader application in risk selection than differentiating various types of anemia. It is a very strong marker for all-cause
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mortality in the general population. It is also a predictive marker for adverse outcomes in individuals with known cardiovascular disease of various types. It is an indicator of an increased incidence of and mortality related to venous thromboembolic disease. RDW is also a predictive and prognostic indicator for some cancers. Adverse outcomes with hip fracture, renal and liver disease are more common with an elevated RDW. In addition, it is an indicator of overall cardiorespiratory fitness.

Higher RDW levels are associated with certain personal characteristics. These include older age, lower level of education, current smoking, higher BMI and a greater likelihood of nutritional deficiencies. In addition, elevated values are associated with the following findings: lower glomerular filtration rate (GFR), reduced hemoglobin levels, higher C-reactive protein (CRP) readings, an increased fibrinogen and white blood cell (WBC) count.

The risk of mortality in the general population has been demonstrated in a variety of studies (Figure 1). The elevation of relative risk begins even within the normal range and steadily gets larger as the value of the RDW increases (Figure 2, page 34). This mortality results from a variety of causes, including cancer, cardiovascular and lung disease, but, interestingly, not due to external sources or traumatic events (Figure 3, page 34). The risk is seen in both men and women (Figure 4, page 36) and in both middle and older ages. Interestingly, the increase in mortality is seen in those with and without anemia. In fact, the relative risk is higher in those without anemia (Figure 5, page 36).

Figure 1

![Image of Figure 1](image_url)
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info@iusolutions.com I www.iusolutions.com
Figure 2

RDW mortality through the normal range
Hazard Ratio by RDW %

Usual upper limit of normal range is 14.5-15.0%

<table>
<thead>
<tr>
<th>RDW Range</th>
<th>Hazard Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 12.5</td>
<td>1.00</td>
</tr>
<tr>
<td>12.5-12.9</td>
<td>1.05</td>
</tr>
<tr>
<td>13.0-13.4</td>
<td>1.18</td>
</tr>
<tr>
<td>13.5-13.9</td>
<td>1.32</td>
</tr>
<tr>
<td>14.0-14.9</td>
<td>1.76</td>
</tr>
<tr>
<td>14.5-14.9</td>
<td>1.88</td>
</tr>
<tr>
<td>15.0-15.4</td>
<td>1.96</td>
</tr>
<tr>
<td>15.5-15.9</td>
<td>2.67</td>
</tr>
<tr>
<td>&gt; 16.0</td>
<td>3.08</td>
</tr>
</tbody>
</table>

Figure 3

RDW and causes of death
Comparison of highest to lowest quintile

Multivariate adjusted hazard ratio – NHANES III data

<table>
<thead>
<tr>
<th>Cause</th>
<th>Hazard Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Cause</td>
<td>2.00</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>2.34</td>
</tr>
<tr>
<td>Cancer</td>
<td>1.68</td>
</tr>
<tr>
<td>Chronic Lung</td>
<td>5.89</td>
</tr>
<tr>
<td>External Causes</td>
<td>1.07</td>
</tr>
</tbody>
</table>
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Figure 4

RDW risk for all-cause mortality by level
Males and females

Figure 5

RDW risk for all-cause mortality by level
By anemia status - males
Multiple studies have indicated an increase in all-cause (Figure 6) and cardiovascular mortality (Figure 7) and non-fatal cardiovascular events in individuals with known coronary disease (Figure 8, page 38). Elevated RDW is also an indicator of adverse mortality outcomes in individuals with acute coronary syndrome and those undergoing angioplasty and bypass surgery. Interestingly, this increased risk is evident after a single reading and persists for at least 10 years in some studies. RDW is associated with other known risk factors for adverse cardiac outcomes. It is associated with elevated CRP readings. However, controlling for the latter does not eliminate the risk (Figure 9, page 38). In addition, higher levels of RDW are a marker for lower levels of cardiorespiratory fitness. There is a strong association between RDW and
Figure 8

**Non-fatal CV events in individuals with established CAD**
Relative risk in multiple studies

Highest compared to lowest category of RDW

<table>
<thead>
<tr>
<th></th>
<th>Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ephrom</td>
<td>1.35</td>
</tr>
<tr>
<td>Nabals</td>
<td>1.48</td>
</tr>
<tr>
<td>Ran</td>
<td>1.66</td>
</tr>
<tr>
<td>Yao</td>
<td>1.95</td>
</tr>
<tr>
<td>Wang</td>
<td>2.13</td>
</tr>
<tr>
<td>Baier</td>
<td>2.6</td>
</tr>
<tr>
<td>Dabash</td>
<td>2.8</td>
</tr>
<tr>
<td>Isik</td>
<td>2.93</td>
</tr>
<tr>
<td>Overall</td>
<td>1.86</td>
</tr>
</tbody>
</table>

Chang et al., J. Thorac Dis. 2014; 6:1428-1440

Figure 9

**RDW and CRP in individuals with CAD**
Relative risk by combinations of the RDW and CRP

Relative risk compared to normal values for the tests

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal CRP, Normal RDW</td>
<td>1.00</td>
</tr>
<tr>
<td>High CRP, Normal RDW</td>
<td>1.18</td>
</tr>
<tr>
<td>Normal CRP, High RDW</td>
<td>1.35</td>
</tr>
<tr>
<td>High CRP, High RDW</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Agarwal S, Indian Heart J. 2012; 64:330-337
heart failure, including cases with both a reduced and preserved ejection fraction (EF) (Figure 10). This includes individuals with elevations of the NT-pro-B natriuretic peptide (NT-pro BNP) (Figure 11). In one study of individuals with heart failure, both an elevated but stable and a lower but rising level of RDW were associated with increased mortality. The highest risk was in those individuals with an elevated and rising value (Figure 12, page 42).
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An elevation of RDW is associated with an increased risk of non-valvular atrial fibrillation. In fact, it is more predictive for fibrillation than many other factors, including CRP levels and left atrial volume. The association is seen in the general population and in those where a history of heart failure or previous myocardial infarction has been excluded, even when MCV levels are taken into account.

An increase in the RDW level is correlated with the presence of and mortality risk related to cerebrovascular disease (Figure 13, page 43). The rate of progression of carotid atherosclerosis is greater and the risk of stroke and death from stroke is higher as the level increases (Figure 14, page 43). This increased risk is associated with all types of stroke except subarachnoid hemorrhage.

In those individuals with peripheral vascular disease, an elevated RDW portends a higher mortality rate. A similar pattern is seen with deep venous thrombosis (DVT), where an elevated level of RDW is a marker for both a higher incidence and case fatality rate.

Incidence rates for cancer are higher in those with an elevated RDW. This occurs in both men and women (Figure 15, page 44). It has been shown to be a prognostic marker in some tumors, most notably lung cancer and multiple myeloma.

The RDW is also an indicator of reduced renal function (Figure 16, page 44) and the presence of microalbuminuria (Figure 17, page 45). In addition, it is a marker for adverse outcomes with various types of liver disease including hepatitis B, steatosis-steatohepatitis and cirrhosis.

Interestingly, an elevation of the RDW level has also been shown to be a marker for adverse mortality results in individuals with a hip fracture. Their risk persists for at least over the next 4 years after the event, even if anemia is not present.

When the RDW is related to a hematologic condition, the cause for excess death rates may be obvious. However, the reason for the above-noted very strong association with mortality in a variety of other conditions is not clear. One cause may be inflammation. Low-grade inflammation may lead to variability in red blood cell size, and it certainly plays an important part in the adverse events associated with cardiovascular disease and other conditions. However, as noted above, controlling for markers of inflammation such as CRP does not mitigate the risk.

Other factors that have been suggested as driving forces for the association with mortality include oxidative stress (important in many disease processes), shortened telomere length (which is related to both cellular aging and increased RDW levels), reduced erythropoietin levels and increased BNP values. However, none have been definitively proven to be causative at this point.
**Figure 13**

RDW and mortality with asymptomatic carotid disease
Risk of all-cause and cardiovascular mortality

Hazard ratio by level of RDW

<table>
<thead>
<tr>
<th>Level of RDW</th>
<th>All-Cause</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;13.3%</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>13.3-13.8%</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>13.8-14.5%</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>&gt;14.5%</td>
<td>2.50</td>
<td>2.50</td>
</tr>
</tbody>
</table>


**Figure 14**

RDW and various types of stroke
Hazard ratios in a population with no previous history of stroke

Comparison of the 4th to the 1st quartile of RDW level

<table>
<thead>
<tr>
<th>Type of Stroke</th>
<th>Hazard Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Stroke</td>
<td>1.31</td>
</tr>
<tr>
<td>Cerebral Infarction</td>
<td>1.32</td>
</tr>
<tr>
<td>Cerebral Hemorrhage</td>
<td>1.44</td>
</tr>
<tr>
<td>Subarachnoid Hemorrhage</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Unfortunately, obtaining accurate RDW results is not practical with the usual insurance blood testing protocols. Prolonged storage of blood before centrifugation, which is common with paramedical collection, frequently leads to breakdown of the RBCs and wide variation in the MCV and RDW, rendering the latter inaccurate. However, the RDW is obtained on virtually every CBC contained in an attending physician statement (APS).

Considering the degree and consistency of the risk associated with an elevated RDW, its use in the underwriting process would seem logical. However, there are important practical issues that should be considered. First, most of the above-cited studies were based on a single reading. However, would an underwriter be comfortable taking an action on a CBC that was performed, say, 5 years ago? Thus, at a minimum, some consideration should be given to a time limit on actionable values.

Second, there is only very limited data available on the risk profile when the RDW level is changing over time. One study, cited previously, showed a higher risk with rising levels over time in patients with heart failure. There is no data on decreasing levels. The fact that readings may differ with different analyzers compounds the issue with serial tests. Nevertheless, if the RDW was to be used in underwriting, the available guidelines should account for the scenario of test variation over time.

Third, although mortality risk scales upward through the normal range and beyond, is it practical to take adverse action on values that do not exceed the laboratory upper limit of normal? One would need to consider at what point in the continuum of readings an action would be taken and debits applied.

Finally, as noted previously, the specific mechanism of action by which the RDW is associated with an increased morbidity and mortality risk is uncertain at this time. In theory, this could pose a problem in explaining adverse actions to agents and attending physicians. However, the weight of the evidence from the clinical literature, as summarized in this article, is so large and compelling regarding excess risk that this is unlikely to be a significant issue in practice.

References

From the 2017 ALU Exam Finalization Meeting in Charleston, SC (left to right): front row - Coordinator Exam 202  Catie Muccigrosso, FALU, RGA Reinsurance; Director of Exams Ann Day, FALU, Western Fraternal Life Assoc.; Medical Consultant Susan Sokoloski, MD, AXA; Past President Margaret Taff, FALU, Vantis Life Insurance; President Frank Goetz, FALU, Pacific Life Insurance Company; Medical Underwriting Task Force Jennifer Johnson, FALU, RGA Reinsurance; Director of Curriculum Jodi McDonald,FALU, Hannover Life Re; Secretary Tanya Trachenko, FALU, Wawanesa Life; Coordinator Exam 301 Doreen Brynga, FALU, VOYA; back row - MRAP Coordinator Joe Keown, FALU, Lincoln Financial; Exam 202 Joanne Kay, Sun Life Financial; Assistant Meeting Planner Jodie Hofmaier, FALU, United of Omaha; Coordinator Exam 101 Lori Boucher, FALU, VOYA; Treasurer Jean Everhart, FALU, Woodmen Life; Coordinator Exam 201 Michael Hill, FALU, RGA Reinsurance.
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BRINGING ADHD INTO FOCUS

Michael Wetzel, MD, DBIM, CLU
OTR Contributing Editor
Vice President and Medical Director
Prudential Insurance Company
Maple Grove, MN
michael.wetzel@prudential.com

**Case 1:** 16-year-old male diagnosed with ADHD. He takes Ritalin SR 20 mg every morning and Ritalin 10 mg after lunch. He is an average student with minor discipline problems noted in APS. Father and brother also have same diagnosis.

**Case 2:** 14-year-old male. He has suffered four concussions since age 8 and had a wrist fracture age 10. He was evaluated in the ER at age 11 after he informed his mother he swallowed four nails while riding to school on the bus because some kids told him to. The metallic nails were seen on an abdominal X-ray and he was to be rechecked in 2 days. The mom never brought him back for the recheck. He was diagnosed 1 year ago with ADHD of the inattentive type.

**Case 3:** 32-year-old male successful business owner who is applying for $20 million for a buy-sell agreement. He takes Adderall for ADD and has been married for 10 years with two children. No other medical history. IRP is positive for amphetamine. He denies any history of recreational drug use or substance abuse.

Attention deficit/hyperactivity disorder presents in children at a young age. There are two categories of core symptoms: hyperactivity/impulsivity and inattention. It is more common in males than females – by a ratio of 4:1 for the hyperactive type and 2:1 for the inattention type. ADHD affects a person’s cognitive, academic, behavioral, emotional and social functioning. The symptoms are noted by parents, teachers and other caregivers.

In 2013 the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM V)* updated the diagnostic criteria for ADHD. Unfortunately, many primary care physicians do not formally adhere to the criteria, and children and adults may be diagnosed with the disorder who do not fulfill all of the criteria.

Attention deficit/hyperactivity disorder (ADHD) is a common disorder of childhood. Now, ADHD is being recognized as a disorder in adults too, and the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM V)* updated the diagnostic criteria for ADHD in 2013. What does that mean for diagnosis and treatment of an adult vs. a child? Have the criteria changed? How is the symptomology affected? What does the underwriter need to know? This article will review ADHD in children and adults, including the diagnostic criteria, the symptoms and comorbid disorders, the treatment and the mortality risk.

It is not unusual to see a parent complain of a “hyper” child or one who doesn’t listen, and then receive a prescription for the child to “see if it makes a difference.” Sometimes a parent will take his child’s medication and then present to his physician requesting his own prescription since it helped him concentrate. The underwriter should assess how the diagnosis was made to better determine the person’s risk.

The diagnosis of ADHD requires a persistent pattern of inattention and/or hyperactivity that interferes with development or functioning. The *DSM V* lists nine symptoms of inattention and nine symptoms of hyperactivity and impulsivity. Six symptoms are required to make the diagnosis in a child and five are required to make the diagnosis in an adult. If the person fulfills both, he is diagnosed with a combined presentation. If he only fulfills one, he is diagnosed as predominately inattentive or predominately hyperactive/impulsive. Other psychological disorders that could cause the symptoms cannot be present.

The inattentive type is characterized by a reduced ability to focus attention and slower cognitive processing and responding. The child may be described...
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as thinking slowly and frequently “daydreaming.” He will be noted to have cognitive or academic problems. The symptoms may include careless mistakes, inattention in play or school, not listening, not completing projects, organization difficulty, avoidance of tasks requiring concentration, losing objects required for an activity or task, easy distractibility and forgetfulness. The symptoms of inattention may not be evident until the child is 8 or 9 years old.

Younger children will present with hyperactive and impulsive symptoms and will be described as unable to sit still or inhibit their behavior. The child may be noted to be fidgety, unable to stay seated, restless, unable to play quietly, talking excessively, not able to wait for his turn, blurting out answers too quickly, interrupting others and difficult to keep up with – always on the go. The behaviors are usually observed at age 4 and increase steadily until age 8. After this age, the hyperactive symptoms decline and may be barely noticeable to others during the teenage years, although the adolescent may feel restless or unable to settle down. The impulsive symptoms, however, usually persist throughout life. The impulsivity is related to environment. An untreated teenager who is exposed to alcohol or other substances of abuse is more likely to use or experiment with that substance than a teenager without ADHD.

For a diagnosis of ADHD, the symptoms must impair the person’s function in academic, social or occupational activities. Children with ADHD will have impaired social skills. The inattention may inhibit the ability to notice social cues necessary for effective social interaction and make it difficult to form friendships. Hyperactive children with impulsive behaviors may experience peer rejection. There may be long-term consequences to impaired social function due to low self-esteem and increased risk of anxiety and depression.

Adults with ADHD will have symptoms of inattention, impulsiveness, restlessness and emotional dysregulation. The symptoms of hyperactivity and impulsivity are not as noticeable in adults as they are in children, while symptoms of inattention are more prominent. The symptoms of inattention in adults are classified as deficits in executive function, which is defined as “self-directed actions needed to choose goals and to create, enact and sustain actions toward those goals.” The executive functions that may be deficient include working memory, task shifting, initiation and self-inhibition. These deficits cause the inattention problems for the adult with ADHD, which are the inability to remain focused on a task for a long period, inability to organize activities and prioritize tasks, not following through and completing tasks, forgetfulness and difficulty with time management leading to missed appointments and deadlines.

The impulsivity in adults often has more serious consequences than in children. The impulsiveness is characterized by excessive involvement in activities or speech that has a high potential for negative consequences, such as premature termination of relationships or quitting a job before securing another one. The person may have an unfavorable driving history with driving errors, traffic tickets and speeding violations, due to inattention and impulsivity.

Adults with ADHD will not appear overly hyperactive like children do but will report feeling fidgety or restless. Like children with ADHD, they will be noted to talk too much and interrupt others. The mood symptoms of adults with ADHD are called emotional dysregulation, which is the inability to manage uncomfortable emotions and to engage in inappropriate behavior when distressed. The symptoms of emotional dysregulation include mood lability, irritability, anger outbursts, low frustration tolerance and motivational deficits.

The long-term consequences of childhood ADHD mentioned earlier (educational difficulties, low self-esteem, impaired social relationships) are believed to contribute to the behavioral problems in adults. Adults with ADHD have increased rates of occupational difficulties, criminal activity, substance abuse, driving violations and traffic accidents.

Historically it was assumed that adulthood ADHD was simply an extension of childhood ADHD. Some recent studies have called that assumption into question. The studies demonstrate that childhood and adult onset ADHD may be two distinct syndromes. A study by Caye et al. looked at the participants in the 1993 Pelotas Birth Cohort Study. Over 5000 children were followed until age 18 and 19. They were screened for ADHD at ages 11 and 18/19. At age 11, 393 children were diagnosed with ADHD with a strong male preponderance. At ages 18/19, 492 participants were diagnosed with ADHD, with a female preponderance. Interestingly, only 60 children who had the diagnosis at age 11 still had the diagnosis at age 18/19. There was very little overlap in the groups.

Another study by Moffitt et al. showed similar results. The participants were 1037 individuals born in Dunedin, New Zealand, in 1972 – 1973. They were followed until age 38. The study “looked forward” at children diagnosed with ADHD and “looked back” at those diagnosed with adult onset ADHD. Only 3%
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of children with ADHD still had the diagnosis as an adult and only 10% of those with adult onset ADHD had a history of childhood ADHD. Most of the children with ADHD were boys, while the study did not demonstrate a sex difference in the adult onset group.

**Treatment**

Treatment of ADHD includes behavior therapy and medication. Behavior therapy is the first line of therapy for preschool-aged children while both are recommended for older children. Behavior therapy involves training parents in techniques that improve their ability to modify and shape their child’s behavior and to improve the child’s ability to regulate his own behavior.

The most commonly prescribed medications for ADHD at all ages are stimulants – methylphenidate (Concerta, Ritalin and others) and amphetamines (Adderall). The mechanism of action is unknown but probably involves increased levels of dopamine and norepinephrine. Adderall is renally excreted so a drug screen will show the presence of amines in the urine. Stimulant medications can be short-acting or long-acting. Possible side effects include sleep disturbance and anorexia. Typically a person will be prescribed a long-acting formulation to take in the morning and a short-acting formulation to take as needed later in the day, to minimize the insomnia associated with the medication. The medications do have abuse potential, and there is a risk of drug dependency with prolonged use. Adults with a history of substance abuse are at higher risk of misuse, addiction and diversion of stimulant medication. Non-stimulant medication is also used to treat ADHD, including atomoxetine (Strattera), bupropion (Wellbutrin) and tricyclic antidepressants. For adults, stimulant medications are more efficacious than non-stimulant medications.

**Risk**

Determining the risk for an individual applicant can be a challenge for the underwriter. It is important to determine if the person has an accurate diagnosis of ADHD or was simply given a diagnosis and started on medicine for vague symptoms. The risk for someone who does not meet the criteria for ADHD may be limited to any misuse of medication or associated psychological diagnosis. However, for someone who has the diagnosis of ADHD, there is a real increased risk of early death. The risk is increased substantially if there is an associated psychological disease or substance abuse history. A person who is compliant with medication and has good control of his symptoms is probably at standard risk. But medication non-compliance is common. Longitudinal studies have shown that treatments are not sustained and children are at greater risk of significant problems if they discontinue treatment.

A study by Barbaresi et al. looked at adults who had a diagnosis of ADHD as children. They had an 88% increased mortality ratio compared to adults without a childhood diagnosis of ADHD. The cause-specific mortality for suicide was significantly higher than the controls, and the majority of those who died had a history of substance abuse and one other psychiatric diagnosis.

A recent study was published by Dalsgaard et al. and has received significant attention. The study used the Danish National Registry of 1.92 million individuals, of whom 32,061 had the diagnosis of ADHD. They were followed from age 1 until the year 2013 – a maximum of 32 years. There was a 50% increase in early mortality in those with ADHD and no comorbid condition. The most common cause of death was accidental. The highest risk of death was within the first 5 years since diagnosis, but the mortality rate was still increased after 10 years from time of diagnosis. The mortality ratio also varied by age at diagnosis. Children diagnosed before age 6 had a mortality ratio of 1.86, those diagnosed ages 6 – 17 had a mortality ratio of 1.58, and adults diagnosed after age 17 had a mortality ratio of 4.25. The mortality increased significantly with a comorbid condition of oppositional defiant disorder, conduct disorder or substance abuse. Those with all three comorbid conditions were eight times as likely to die as someone without ADHD and none of those conditions. The authors point out that a limitation of the study is that the clinical practice in Denmark is more restrictive in diagnosing ADHD than in the United States, as I mentioned early.

ADHD is a common disorder of childhood that requires fulfillment of specific criteria to confirm a diagnosis. Children can have a predominant inattention type, a predominant hyperactive/impulsive type or a mixed type. Adults will have symptoms more of inattention. The disorder affects a person’s ability to form friendships, which has long-term adverse effects. Treatment consists of behavior therapy and medication. People with ADHD have increased mortality, which is magnified if there is an associated psychological diagnosis or substance abuse. Looking at the cases listed at the beginning of the article, I would consider #1 and #3 to be standard risks. I would not offer on case #2 until I had evidence of medication compliance and symptom control.
References
Up To Date: Attention deficit hyperactivity disorder in adults: Epidemiology, pathogenesis, clinical features, course, assessment and diagnosis.
Up To Date: Attention deficit hyperactivity disorder in children and adolescents: Clinical features and diagnosis.
Up To Date: Attention deficit hyperactivity disorder in children and adolescents: Epidemiology and pathogenesis.
Up To Date: Pharmacology of drugs used to treat attention deficit hyperactivity disorder in children and adolescents.
Up To Date: Pharmacotherapy for adult attention deficit hyperactivity disorder.

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EXAMINING THE RELIABILITY OF HAEMOGLOBIN A1C IN ASSESSING RISK

Case study
28-year-old female applying for USD 285,000 whole life cover with no riders:
- BMI 36.8
- BP 120/80
- No declared adverse medical history - normal ECG
- 29 Dec 2015 blood test – all values normal save for HbA1c 6.6% (FBS 94 and urine glucose negative)

The underwriter rates as a newly discovered diabetic and overweight; however, the applicant questions the decision, denying she is diabetic, and submits a repeat A1c test 1 month later of 6.0% with a FBS of 94. Both blood tests were performed by the same reputable hospital in Thailand.

From an underwriting standpoint, is this applicant diabetic or are we only to be concerned about current build? What is the explanation for these inconsistent A1c results, performed just 1 month apart? This article will address the factors responsible for false-positive and false-negative A1c results. This insight will hopefully add value to the risk assessment of this and other interesting A1c conundrums.

Haemoglobin A1c is formed as part of protein glycation, which is the attachment of glucose to protein molecules. This glycation process is boosted when plasma glucose concentrations are consistently elevated.

Haemoglobin is the protein in red blood cells (RBCs) that carries oxygen from the lungs to the body’s tissues and returns carbon dioxide from the tissues back to the lungs. RBCs have an average lifespan of 120 days (117 days in men and 106 days in women),¹

Executive Summary
Haemoglobin A1c (A1c) has proved a useful test for underwriters. It is customer friendly as it does not require fasting and has been recommended as one of the tests to help diagnose Type 2 diabetes and pre-diabetes. However, there are certain factors that can influence either false-positive or false-negative A1c values. This article attempts to identify those factors.

and as such the A1c value represents glycemic history (glucose levels) over the previous 2-3 months with the preceding 30 days accounting for 50% of A1c.²

A1c was first described by Rahbar et al. in 1969.³ Since that time and supported by various medical studies, it has been shown that A1c levels correlate well with long-term glycemic control. In 1994 the American Diabetic Association (ADA) recommended A1c use as a blood test to measure the effectiveness of diabetes management. In 2010, the ADA supported the use of A1c as an alternative to fasting blood sugar or an oral glucose tolerance test, as a diagnostic tool for diabetes. Of course, these recommendations vary according to different expert groups and screening.

Elevated A1c in non-diabetic applicants (false-positive results)
Iron deficiency anaemia (IDA) has been identified in causing falsely elevated A1c. This is due to the fact that increasing the mean age of RBCs will increase A1c. Shanthi et al.⁴ showed higher A1c levels in IDA patients as compared to a control group. The mean A1c level (7.6% +/- 0.5) in patients with IDA was higher than that in the control group (5.5% +/- 0.8). However the levels of fasting and postprandial glucose between the two groups were the same. Shanthi postulated that in IDA the structure of the haemoglobin molecule could be altered, and as a result the
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glycation of the β-globin occurs more readily, falsely elevating the A1c in these patients.\textsuperscript{5}

Hong et al. investigated the association between IDA and A1c levels in Korean adults.\textsuperscript{6} Similar to Shanthi’s findings, Hong found that A1c levels were higher in participants with IDA than in the control group and that there was no significant difference in fasting glucose levels. Hong also concluded that IDA did not affect A1c levels in known diabetics or in those with A1c levels greater than 6.5%. Both studies concluded that IDA should be considered before using A1c level as a screening parameter for diabetes.

It has also been reported that certain haemoglobin variants (haemoglobinopathies) can alter A1c measurements through various mechanisms. Chen noted that a 67-year-old male with haemoglobin Wayne was suspected of having diabetes based on an A1c level of 6.5%. The patient’s BMI was 18, and after repeated monitoring of his blood glucose with a glucometer, it was noted his glucose was normal - 100 mg/dl.\textsuperscript{7} The haemoglobin Wayne interfered with the A1c assay method used in the laboratory, resulting in a false-positive result.

**Decreased A1c in non-diabetic applicants (false-negative results)**

Certain medications have also been found to give inappropriately high or low A1c. Medications which cause hemolysis have been found to lower A1c by reducing red blood cell lifespan, increasing the proportion of immature red blood cells in the blood. Dapsone, ribavirin and some antiretroviral drugs have been reported to reduce A1c in this manner.

Dapsone was reported as early as 1979 in the United Kingdom for causing false-negative A1c levels. A subsequent report from the United States and France reported similar findings.\textsuperscript{8} In 2008, Robertson found a similar phenomenon treating a patient with ribavirin, a medication for hepatitis C.\textsuperscript{9} He had been treating a 55-year-old diabetic patient with chronic hepatitis C with ribavirin and noted an A1c level of 4.4%, in spite of persistently high blood glucose values. Subsequent cessation of ribavirin resulted in an increase in A1c to 6.5%.

Vitamin C and E in high doses have also been reported to lower A1c levels by reducing the rate of glycation of haemoglobin. The degree to which this happens in non-diabetics is uncertain.\textsuperscript{10} Interestingly there seems to be no impact on A1c when pharmacological doses of vitamin C or E were given to known diabetics.\textsuperscript{11}

Other treatments that can interfere with A1c levels include hydroxyurea (used in the treatment of myeloproliferative disorders and sickle cell disease); chronic use of aspirin in large doses has also been shown to lower A1c levels.

| 1. Erythropoiesis | Increased A1c: iron, vitamin B12 deficiency, decreased erythropoiesis  
<table>
<thead>
<tr>
<th></th>
<th>Decreased A1c: administration of erythropoietin, iron, vitamin B12 reticulocytosis, chronic liver disease</th>
</tr>
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<tbody>
<tr>
<td>2. Altered Haemoglobin</td>
<td>Genetic or chemical alterations in haemoglobin; haemoglobinopathies, HbF, methaemoglobin, may increase or decrease A1c</td>
</tr>
</tbody>
</table>
| 3. Glycation | Increased A1c: alcoholism, chronic renal failure, decreased intra-erythrocyte pH  
| | Decreased A1c: aspirin, vitamin C and E, certain haemoglobinopathies, increased intra-erythrocyte pH.  
| | Variable A1c: genetic determinants |
| 4. Erythrocyte destruction | Increased A1c: increased erythrocyte lifespan: splenectomy  
| | Decreased A1c: decreased erythrocyte lifespan: haemoglobinopathies, splenomegaly, rheumatoid arthritis or drugs such as antiretrovirals, ribavirin and dapsone |
| 5. Assays | Increased A1c: hyperbilirubinaemia, carbamylated haemoglobin, alcoholism, large doses of aspirin, chronic opiate use  
| | Decreased A1c: hypertriglyceridaemia  
| | Variable A1c: haemoglobinopathies |
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The original case study involving a 28-year-old overweight female applicant remains unresolved. She has two varying A1c values yet normal FBS test results, no disclosed medical history and otherwise normal laboratory tests with no other contributory information. Both A1c’s were performed at a reputable private hospital in Thailand.

It was noted that the applicant resides in northeastern Thailand where there is a high frequency of Hb E/β-thalassaemia (a haemoglobinopathy). This is a possible explanation; however, IDA was ruled out as a possible contributing cause. Unfortunately, there were few other leads to follow. One might be tempted to speculate that the applicant consulted a doctor after her initial test result was elevated and she might have been started on anti-hyperglycemic medication. However, there was nothing to support this hypothesis.

**What might be the most appropriate underwriting decision for this curious case?**

Notwithstanding the fact that the initial A1c result is suspicious for possible diabetes, the applicant’s weight is of particular concern and this predisposes her to developing diabetes. However, one must take into consideration the fact that both FBS’s were normal, which casts some suspicion on the possible accuracy of the first A1c result. It would be advisable to request an up-to-date attending physician’s statement (APS) to confirm that anti-hyperglycemic medication was not prescribed nor taken. If the APS confirmed this, and in the absence of further information, the author would have rated the case according to the relevant loading for the applicant’s build.

**Summary**

For the most part, A1c values give an accurate representation of blood sugar control for the preceding 60-90 days. However, many factors can provide false readings and underwriters should ensure that they recognize these factors.

**Notes**

5. B. Shanthi.
8. R. Unnikrishnan et al.
9. B. Shanthi.
10. R. Unnikrishnan et al.

**About the Author**

Gary L. Miles joined AXA Regional Health & Protection in September 2014. He began his underwriting career in Canada where he worked and gained experience in Life, Critical Illness, Group Accident and Disability underwriting. From there Gary moved to the Bahamas where he managed a Health and Life Underwriting team for a local insurer. Having spent 2 years in the Bahamas, Gary then moved to Singapore to join Munich Reinsurance. After 6 years in a regional role, Gary transferred to Dubai, UAE, to take the position of Chief Underwriter Gulf Cooperation Council for Munich Reinsurance. He then moved to Hong Kong and is now the Regional Chief underwriting Officer with AXA.
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EXECUTIVE SUMMARY

Since the completion of the Human Genome Project in 2003, there has been great anticipation of a revolution in the medical sciences. Tangible results of that scientific endeavor are now being seen with the rapidly growing use of genomics in many fields of clinical medicine. While the practice of medicine has always viewed patient care as individualized, it is only now, primarily as the result of advancing technology in the field of genomics, that true precision in and personalization of care are being delivered. This article discusses this advancing field of medicine and assesses its potential impact on insurance medicine.

重大发展与生物信息学、基于云的处理技术及机器学习将需用于分析大量数据集以揭示基因组的秘密。

Genomics has led to a growing number of clinical applications, including pre-disease risk assessment (and mitigation), refined disease diagnosis and prognostication, and the design of individualized treatment protocols. From an underwriting point of view, the impact of genomics cannot be understated, and from a medical point of view, is not even close to being fully realized. While essentially every branch of medical science has already been affected by genomic medicine, the primary areas where it is currently having its most visible impact are in the developing field of pharmacogenomics and the diagnosis and treatment of cancer.

Pharmacogenomics

The emerging field of study combining pharmacology and an individual’s genomic profile is known today as pharmacogenomics. Often, pharmacogenomics is described as “giving the right medicine at the right dose at the right time” in order to optimize favorable outcomes.

Daniel D. Zimmerman, MD
Vice President and Medical Director
RGA Reinsurance Company
Chesterfield, MO
dzimmerman@rgare.com

Introduction

The National Institutes of Health (NIH) defines precision medicine as “an emerging approach for disease prevention and treatment that takes into account individual variability in genomics, environment, and lifestyle for each person.” Historically, most medical treatments have been designed for the so-called “average patient.” As a result of this one-size-fits-all approach, treatments can be very successful for some but not for others.

Precision medicine gives clinicians tools to better understand the complex mechanisms underlying an individual patient’s health risks, disease or condition, and to better predict which treatments will be most effective. It is hoped that this new “golden age” of medicine will lead to improved therapies and interventions to prevent and treat disease in a more efficient and effective way, thereby leading to decreased mortality and morbidity. Indeed, if the promises of precision medicine hold true, there will clearly be a significant impact on the life and living benefits insurance industry.

The Basis of Precision Medicine: Genomics

Genomics is the study of genes, their interactions with each other and the environment, and the resulting phenotype (physical manifestations and biochemical characteristics) of an individual. Genomic medicine is the emerging discipline that involves using genomic information and associated biomarkers to drive clinical care and create molecularly targeted therapies.

The increased speed and decreased cost of gene sequencing over the last 15 years have resulted in larger and more refined databases from which personalized clinical applications can now be developed.

Understanding the enormous complexity of genomics requires multidisciplinary cooperation from both the government and private sectors. Not only is advanced high-throughput DNA sequencing necessary, but
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Much attention in precision medicine has been focused on pharmaceuticals and the great variability of effects on individuals. It has always been very difficult to predict who might benefit from a given medication, who might not respond at all, and who might experience adverse side effects. It is now known that genetic variations can impact how an individual absorbs, distributes, metabolizes and eliminates pharmaceuticals.

Approximately 7% of medications approved by the US Food and Drug Administration (FDA) are affected by actionable inherited pharmacogenes. The FDA website specifically names approximately 165 medications with pharmacogenomic information in their labeling. Such information may include specific actions to be taken based on genetic biomarker information. Some of the listed medications are in common use, but rarely do clinicians actually order pre-treatment genomic testing for these medications.

Barriers to widespread use of pharmacogenomic testing include a lack of clear clinical guidelines and few controlled studies comparing genomically guided treatment with conventional therapy. In addition, professional societies and groups developing treatment guidelines can and do disagree on pharmacogenomic testing recommendations. There has, for example, been disagreement on pharmacogenomic testing recommendations for the blood thinner warfarin and the platelet aggregation inhibitor clopidogrel, drugs both commonly seen during underwriting.

Analyzing an individual’s genomics is only part of the approach to precision drug treatment. While genomic studies can provide significant information, it is at the protein level that cellular processes are functionally regulated, and genomic results alone do not necessarily correlate with corresponding protein abundance and function. Thus, the proteome – the entire complement of proteins produced by an organism – must be studied along with the genome. This particular area of research is termed pharmacoproteomics.

Precision medicine must encompass both pharmacogenomics and pharmacoproteomics in order to provide true clinical utility. The personalized “omics” approach should improve understanding of disease and drug mechanisms and allow for greater discovery, detection and monitoring of novel biomarkers for a variety of complex diseases and their treatment. Success in this field of medicine should have a significant and favorable impact on mortality and morbidity outcomes, and potentially affect the approach to risk stratification in the future.

**Precision Medicine and Cancer**

The concept of applying genomics to cancer treatment is becoming one of the most clinically useful examples of precision medicine. Every cancer patient has a unique profile of inherited as well as tumor-specific genetic variants that influence the risk, onset and progression of their disease. Developing a personalized approach to individual patients with the aim of providing optimal outcomes is becoming a reality due to significant progress in the genomic characterization of tumors. In fact, in 2015 alone, the FDA approved 18 new agents for cancer, nearly all of which were based on the principles of precision medicine.

One approach is to carry out whole exome sequencing (WES) of the tumor cells obtained at biopsy or surgical excision. (The exome is the portion of the genome which codes proteins.) By doing so, specific genetic abnormalities can be determined, which then may allow specific targeted treatment or immunotherapies to be prescribed. Additionally, WES of the patient’s somatic (body) non-cancerous cells can be done to compare with the tumor sequencing. One study discovered that there were a mean 17.3 cancer-relevant somatic mutations per patient in the study and that 91% had actionable variants. Moreover, the course of treatment was altered in approximately 10% of the study participants as a result of the testing. The study also demonstrated that the results of WES in diagnostic testing were superior to those of some commercially available targeted cancer panels in common use today.

Other researchers are beginning to advocate for whole genome sequencing (WGS), rather the more limited WES. WGS, which sequences the entire genome including the non-protein coding regions, may reveal additional variations which could be relevant to understanding the development of cancer and designing targeted therapies.

Clinicians have been slow to adopt tumor sequencing as part of cancer treatment protocols. This is partly due to a lack of good clinical data (in many instances) supporting these novel approaches, unique differences in local and regional standards of practice, access to laboratories which can perform these high-tech analyses reliably, and reimbursement concerns. Attitudes toward such tests might also differ, depending upon whether the clinician is practicing oncology at a research institution or a community-based practice.

To date, tumor sequencing has had the most impact on advanced or refractory tumor treatment. Universal tumor testing is more controversial. Two recent point-counterpoint opinion articles highlighted the
division among clinicians. Nonetheless, as significant advances are made and scientifically verified, the application of genomics in cancer treatment will certainly move forward.

**Limitations and Challenges of Precision Medicine**

The rapid development of genomics and precision medicine has generated genomic data at a rate that exceeds the ability of researchers and clinicians to adequately capture, fully analyze and properly interpret them. The extent to which doctors can apply genomic data in directing clinical treatments remains to be determined and is likely to vary over the short term. This is partly due to an absence of evidence-based standards for regulation, clinical decision-making and costs.

One of the main challenges of precision medicine is the requirement for new scientific methodologies to determine clinical utility in small target populations. Traditionally, clinical research is performed on large populations in order to establish statistical significance (i.e., validity). Developing personalized therapies will require new approaches to this paradigm and will introduce new uncertainties, at least for a while, in medicine. In fact, as precision medicine advances, the line between clinical research and clinical care may become blurred. In addition to establishing the accuracy and reliability of genomic medicine, social issues such as cost and access to care will need to be addressed by policymakers who direct the many diverse health care systems around the world.

**Impact on the Insurance Industry**

The use of genetic and genomic information in the insurance industry has historically been challenging and subject to significant regulatory restrictions. Insurers have always striven for fairness and symmetric access to information which is or may be predictive of risk. With genomics now becoming a mainstay of regular medical care, how that information is assessed for risk stratification purposes must be constantly assessed, as precision medicine and all of its offerings may significantly change the way applications are underwritten and also how claims are adjudicated.

The new discoveries in genomic and precision medicine offer opportunities for insurers to develop new products to benefit insured lives. Much recent discussion has centered on genetic testing’s wellness benefits post-issue, with the expectation that genomic information might help covered individuals mitigate their risk by making preventative alterations to lifestyle and undertake disease monitoring. Offering coverage for pharmacogenic testing or WES (or even WGS) tumor testing as a living benefit to potentially improve client outcomes from both a morbidity and mortality point of view will also be given further research and consideration by the industry. It will be extremely important moving forward for insurers to continue the strict practice of treating an individual’s genomic information carefully and guaranteeing the insured’s privacy.

It is, to be sure, an exciting time in the history of clinical medicine and in insurance medicine as well. The changes now being witnessed and those to come will undoubtedly have long-lasting and potentially beneficial effects for both clients and the industry.

**Notes**

About the Author

Daniel D. Zimmerman, MD, is Vice President and Medical Director of RGA Reinsurance Company and a member of RGA’s Global Support Team. He is responsible for case consultation, product development, client support, and internal and external education. Additionally, he serves as co-editor of ReFlections, RGA’s global medical newsletter.

He is also Deputy Managing Director of the Longer Life Foundation, the not-for-profit partnership between RGA and Washington University School of Medicine that funds clinical research into lifestyle, environmental and genetic factors that impact mortality and morbidity.

Before joining RGA in 2014, Dr. Zimmerman was a medical director with Northwestern Mutual Life Insurance Company for 8 years. Previously, he practiced primary care internal medicine and pediatrics in Tampa, FL.

Dr. Zimmerman’s medical doctorate is from the University of Wisconsin School of Medicine and Public Health and his undergraduate degree is from the University of Wisconsin – Madison. He has held leadership positions with the American Council of Life Insurers (ACLI), participated in program committees of the American Academy of Insurance Medicine (AAIM), and frequently represents RGA to key industry professional organizations. He has also contributed several articles to the Journal of Insurance Medicine.
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Amy Prestegaard, Vice President of Program Development, leads a discussion.

Your Program Committee putting together an exciting meeting to support 2017’s theme Appetite for Disruption.

The Executive Council discussing membership and association issues in San Diego.

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HIGHLY SENSITIVE TROPOVINN AND CRITICAL ILLNESS INSURANCE: HAVE THE GOALPOSTS MOVED AGAIN?

Alban Senn, MD
Medical Officer
Munich Re
Munich, Germany

Timothy Meagher, MB, FRCP(C)
Vice President and Medical Director
Munich Re
Montreal

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Over the past 50 years, various blood tests have been used to corroborate a diagnosis of myocardial infarction (MI). At the outset, these were used in a supportive manner for a diagnosis that was primarily clinical and electrocardiographic. In the last 3 decades, as the blood tests (now called “cardiac biomarkers”) became more refined, they assumed greater diagnostic importance. This is reflected in the three European-North American “consensus” definitions of MI that have been published in the past 15 years. In the first definition, published in 2000 by the Joint European Society of Cardiology/American College of Cardiology, elevated cardiac biomarkers became the cornerstone of the clinical diagnosis: “a typical rise and gradual fall (troponin) or more rapid rise and fall (CK-MB) of biochemical markers of cardiac necrosis,” was required to satisfy the diagnosis. In the 2007 Universal Definition of Myocardial Infarction of the joint ESC/ACCF/AHA/WHF, the wording was modified: “typical rise and gradual fall” was replaced by “a detection of the rise and/or fall of cardiac biomarkers (preferably troponin) with at least one value above the 99th percentile upper reference limit (URL).” This definition thus anointed troponin (cTn) as the preferred biomarker.

In 2012, the ESC/ACCF/AHA/WHF published the Third Universal Definition of Myocardial Infarction. While the wording of the 2007 definition was largely unchanged, the cTn levels required to satisfy the diagnosis of MI following percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) were changed. This modification reflected both the increasing experience with troponin measurements and the arrival of highly sensitive troponins (hs-cTn).

Cardiac troponins were introduced to clinical care in the early 1990s. They are structural proteins that attach to the thin actin filaments of cardiac muscle and regulate calcium-actin-myosin binding and thus muscle contraction. A smaller amount of cTn, perhaps 5%, is present in the cytosol; it is hypothesized that leakage from this cytosolic pool explains cTn elevations following pulmonary embolism and marathon running.

Three isomers of cTn are expressed in cardiac muscle, cTn-T, cTn-I and cTn-C. As cTn-C is also detected in skeletal muscle, current cTn assays target either cTn-T or cTn-I. There does not appear to be any inherent diagnostic advantage of one over the other. The presence of cTn in peripheral blood indicates cardiac myocyte damage, usually myonecrosis. However, the hs-cTn assay can detect tiny amounts of troponin in healthy individuals; these are likely a reflection of physiologic cardiac cell turnover. Their presence fuels an ongoing debate whether all cTn elevation is pathologic. For the present and until this debate is resolved, all cTn elevations are presently considered a reflection of myocardial damage.

Over the past 10 years, the assays for detecting cTn have become progressively more sensitive. Their nomenclature, unfortunately, is confusing, with monikers such as contemporary, conventional, 4th generation, medium-sensitivity, sensitive, highly sensitive, super-sensitive and ultrasensitive—tending to confuse rather than enlighten. By convention, a “highly sensitive” assay is one that can detect cTn in 50% of a normal (i.e., reference) population. In contrast, a “conventional” assay, i.e., the assay that is in widespread use in North America, detects cTn in only 1%-20% of normal individuals. Highly sensitive cardiac troponin (hs-cTn) assays, which are...
Advantages

1. As the hs-cTn assays can detect cTn levels about 10 times lower than conventional assays, many individuals who would previously have been labeled “unstable angina” will now be diagnosed with MI. This ability to detect new MIs has been demonstrated in most but not all studies. A representative Swiss study evaluated 1124 consecutive patients presenting with suspected MI. The use of hs-cTn resulted in 242 diagnosed MIs rather than 198 with the conventional assay, a relative increase of 22%. Other studies have shown increases ranging from 7% to 82%.

2. The arrival of hs-cTn will identify individuals with a worse prognosis. Recent data have demonstrated that patients diagnosed with MI following a positive hs-cTn test have poorer clinical outcomes than those who remain in the unstable angina cohort. In the Swiss study, the 30-month mortality rate was 23.9% in patients diagnosed with the conventional assay, 16.4% in those diagnosed with the hs-cTn assay (p = 0.001) and 4.8% in those without MI.

3. High-sensitivity cTn will allow more rapid “rule out” and “rule-in” of MI. A negative hs-cTn at time of admission rules out MI with a sensitivity of around 90%-95%. After 3 hours, the sensitivity rises to 99%-100%. This will allow earlier patient discharge than is presently the case. Conversely, hs-cTn will also permit a more rapid MI “rule-in” if values are elevated at time of arrival and even more elevated with a second estimation 3-6 hours later; conventional hs-cTn requires repeat blood draws at 6 and 12 hours. A more rapid “rule-in” will allow definitive treatment to be started earlier. As experience with hs-cTn accumulates, it is possible that this time schedule will be shortened further. A 2-hour “rule-in,” “rule-out” protocol for acute MI has been studied in patients with suspected ACS; only 20% of patients required prolonged surveillance.

Highly Sensitive Troponin Testing Major Shortcoming

While the heightened sensitivity of hs-cTn brings significant advantages, the price is poorer specificity. In comparison to the conventional assay, many more conditions, both cardiac and non-cardiac, will enter the differential diagnosis (See Table 1, next page). This will cause substantial challenges in the emergency room and a substantial challenge for the critical illness claims adjudicator. So, while the negative predictive value of a normal hs-cTn at 3 hours is close to 100%, the positive predictive value (PPV) of an elevated hs-cTn may be as low as 50%, depending on the clinical setting (disease prevalence or pre-test likelihood of disease). In the emergency department, it is suggested that only 50% of elevated hs-cTn can be explained by ischemic myonecrosis. So, while the ability to quickly “rule out” MI and to detect smaller MIs are clear advantages, they are offset by an ever-lengthening list of differential diagnoses.

The dilemma arises when the hs-cTn is elevated at time of arrival in the emergency room. The 2012 criteria for the diagnosis of MI require “a detection of the rise and/or fall of cardiac biomarkers (preferably tropinin) with at least one value above the 99th percentile upper reference limit (URL).” Thus, a second and higher hs-cTn value is required to confirm the diagnosis. When the clinical presentation is typical (e.g., classical retrosternal chest pain in a 55-year-old, hypertensive smoker), a subsequent minor hs-cTn rise might satisfy the treating physician. When the clinical presentation is not typical (e.g., non-anginal chest pain, few or no vascular risk factors in a 40-year-old woman), the treating physician may
deem a similar rise inadequate. The 2012 consensus definition recognizes this conundrum and specifically mentions: “The term myocardial infarction (MI) should be used when there is evidence of myocardial necrosis in a clinical setting consistent with acute myocardial ischemia.”

However, it can be fairly anticipated that physicians will differ in their evaluation of both the clinical setting and the relevance of different degrees of hs-cTn elevations. Inappropriate labels of MI will be assigned raising the specter of inappropriate CI claims.

Ideally, a quantification of hs-cTn change, in either absolute or relative terms, could avoid an insignificant increase being incorrectly assigned to cardiac myonecrosis. However, there is presently no agreement about appropriate change values or how to recognize values that represent simple analytical variation. As hs-cTn values differ by race, ethnicity, age and sex, one can anticipate that it will be some time before agreement on change values is reached.

**Highly Sensitive Troponin Assays Drawbacks**

When compared to cTn, all analytical problems are accentuated with hs-cTn assays. As it is an immunoassay, it is subject to interference by heterophile antibodies that competitively bind to the cTn epitope, falsely increasing the hs-cTn result. Autoantibodies to cTn are found in 5% to 20% of individuals and will reduce detection of hs-cTn. Values will also differ depending on specimen type, i.e., blood vs. plasma vs. serum. Finally, hemolysis can also affect test accuracy, underscoring that pre-analytic issues will require special consideration. Clinicians who are not familiar with these analytical drawbacks may make decisions based on flawed information.

**Impact on Number of Diagnosed MIs and Critical Illness Claims**

At first flush, it would appear that the introduction of hs-cTn will produce an increase in the incidence of MI and hence CI claims for MI. However, the real answer will probably be more nuanced. The following factors may mitigate this anticipated increase:

1. The incidence of MI in most countries has been decreasing over the past decades, largely due to more effective primary prevention. Should this trend continue, the impact of hs-cTn might be blunted.

2. This reduction in MI incidence occurred despite the replacement of CK-MB in the late 1990s by cTn, followed by year-on-year improvements in cTn assay sensitivity (today’s assays are 1000 more sensitive than the prototype cTn). One might have anticipated an increase in MI incidence over this period, rather than the opposite.

3. If the hs-cTn assay is detecting MIs that are occurring in individuals who are at higher risk than average, underwriting may have a salutary effect. Several studies suggest that, in fact, hs-cTn predominantly detects MI in older individuals who have a higher prevalence of established CAD and a higher prevalence of hypertension, hyperlipidemia and diabetes. In the Swiss study, almost half of the “only diagnosed with hs cTn group” had a previous MI, compared to 30% of those diagnosed with conventional cTn. Extrapolating from these studies, it seems likely that underwriting would mitigate some fraction of future claims in a similar group of insured lives.

4. The evidence that hs-cTn will detect more MIs is not entirely concordant. In one study, which compared the diagnostic performance of hs cTn to standard cTn testing in an emergency department setting, no significant difference in MI diagnosis was found.

5. While the global insurance experience with critical illness claims for MI is not available, a major reinsurer in Canada has not experienced an unexpected increase in claims over the past decade, a time during which the diagnostic criteria for MI changed and troponin testing became more sensitive (Munich Re internal data). While sufficient time has not elapsed to be fully confident about this observation, it is nonetheless pertinent.

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<tr>
<th>Table 1. Cardiac and Non-Cardiac Causes of HS-cTn Elevation</th>
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<td><strong>Cardiac Causes</strong></td>
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<td>Heart Failure</td>
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<td>Cardiac Contusion</td>
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<td>Rhabdomyolysis with Myocyte Necrosis</td>
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Challenges for Critical Illness Insurers

The introduction of more sensitive tests and repeated changes in the definition of MI pose a challenge if they result in an unexpected number of claims or if pricing has to be repeatedly adjusted. CI definitions, for both MI and other covered conditions, have evolved in different directions in different jurisdictions in an effort to future-proof against such challenges. In some countries, “measures of severity” (e.g., imaging evidence of myocardial damage) have been added, whose purpose is to prevent claims for minor or “non-critical” variants of a covered condition. While this sounds logical, it creates problems of its own: the more an insurance definition deviates from the accepted clinical definition, the more difficult to defend it, should litigation ensue. Other jurisdictions have taken the opposite tack: the CI definition approximates as much as possible the clinical definition, and the price is adjusted accordingly.

The arrival of hs-cTn may well restart discussions. Its ability to diagnose ever-smaller infarctions might push some insurers in the “severity measure” direction, arguing that such a move would be “in the spirit” of CI insurance. However, the counterarguments are substantive: (i) hs-cTn is not identifying innocuous infarcts, (ii) the more an insurance definition deviates from a clinical one, the more contentious the claim and more likely the litigation, (iii) brokers and clients may perceive that a “watered-down” version of heart attack is not an attractive purchase.

Conclusion

The arrival of hs-cTn will result in a shift from the diagnosis of “unstable angina” toward the diagnosis of MI. It is unclear if there will be an increase in the number of MIs, given the overall context of decreasing MI incidence and the risk profile of individuals in whom hs-cTn appears to be most effective. However, as hs-cTn is substantially less specific than conventional cTn, there is a high likelihood that other medical conditions causing elevated hs-cTn will be mislabeled as MI.

Until such time as algorithms are developed to appropriately guide the treating physician faced with an elevated hs-cTn, this situation is likely to continue. The adjudication of critical illness claims for MI will become more challenging. When faced with an MI claim and an elevated hs-cTn, the assessor will have to contextualize all the relevant information and decide if the evidence for MI is compelling. Insurers may have to revisit their definitions and decide whether a measure of severity should be added. The arrival of hs-cTn illustrates that CI definitions will always be a work in progress. Let’s get used to shifting goalposts; they’re not settling down anytime soon.

Notes

AVOID MISREPRESENTATION AND FRAUD IN LIFE INSURANCE - TIPS ON FOREIGN NATIONALS

Keith Brown, FALU
Vice President, Risk Management &
Chief Underwriter
Gen Re
Stamford, CT
keith.brown@genre.com

Executive Summary
Increasingly, companies are exploring the possibility of insuring foreign nationals. However, foreign national markets can provide unique challenges that often don’t lend themselves to traditional US underwriting approaches. This article explores some potential underwriting pitfalls associated with underwriting this market and tips to help successfully avoid material misrepresentation and fraud. This article is a follow-up to Keith Brown’s December 2015 article titled “Avoiding Material Misrepresentation and Fraud in Life Insurance; Overview, Application and Red Flags.”

Oftentimes at industry meetings, the question is raised, “Is underwriting life insurance on foreign nationals the next IOLI/STOLI?” Those of us familiar with the ongoing impact of IOLI/STOLI business certainly hope not, but also understand why the question arises.

Working as Chief Underwriter at Gen Re has afforded me opportunities to see an increasing number of life insurance companies working on initiatives to write more business on wealthy foreign national clients. No doubt some profitable business may be written as wealthy clients utilize life insurance as an interest rate hedge against rates in their home countries, but companies thinking of expanding into or entering this market need to be aware of the market’s unique underwriting challenges in the areas of material misrepresentation and fraud.

Applicants who are foreign nationals should be underwritten with caution in terms of evaluating overseas income, assets, liabilities, net worth and medical histories. Often this type of information is impossible to verify or too expensive or impracticable to investigate. In addition, accounting standards and legal considerations can vary greatly on an international scale.

It is imperative to know labor and compensation statistics for the countries in which foreign national applicants reside. Incomes on foreign nationals are often overstated in terms of US dollars. For example, you might receive an application on a foreign national who is a physician. The applicant indicates he earns the equivalent of $250,000 per year. However, when you check the country’s labor and compensation statistics, you learn the average annual compensation for a physician is the equivalent of say $42,000.

This should raise a red flag and merit additional underwriting scrutiny. Some good online sources for conducting such research include The World Bank, Inside Higher Ed, Bloomberg, The Wall Street Journal, Worldwide-tax.com and Glassdoor.

One could also speculate that an applicant who has immigrated to the United States would be expected to convert or bring anything of financial value with him, and if the applicant has not done so, the initial presumption is that any such amounts should not be given credit for income replacement or estate purposes. This should also prompt a question regarding whether or not the individual plans to return someday to the country in which he or she maintains assets.

Customs, laws and culture can vary greatly depending on the country of origin for a foreign national applicant. Underwriters in North America may assume that information provided by the applicant is consistent with what is typically expected in the US and Canada, but that is not always the case. For example, “income” may actually include the income...
of all family members and “ownership” agreements may actually be only verbal agreements. In some cultures, “saving face” may be a crucial custom, with the impact that actual medical histories or financial information may not be disclosed.

It is essential to establish whether policyowners and proposed insureds can understand the language (typically English) in which the application forms and policy are written. If a translation service is utilized, it is best if the writing company chooses and vets the service thoroughly itself. Relying on producers to provide translation services opens the door for anti-selection and may significantly impede contestability. If the policyholder dies and a claim is contested, the plaintiff’s attorney could argue that, rather than obtaining the records from a disinterested third party, the company ignored any potential conflict of interest and relied on records from the paid producer on the case. Contesting can be quite a challenge for the insurance company after such a statement.

If producers in the foreign national market insist on utilizing an attending physician statement (APS) provider that is small and unknown in the insurance industry, make sure your company vets the provider thoroughly before allowing. Is the APS provider actually part of another unrelated business? Are employees full- or part-time? Does the agent or agency that is the source of the business have an ownership interest (potential conflict of interest) in the APS provider? Are you receiving translated or untranslated APSs? If translated, who is the translation service working for—your company or the producer?

There have been instances where some producers have been reported pushing to use a little-known APS provider whose service is part of another unrelated business. The producer had active ownership and management of the APS service provider and the other business as well. It may be best to use a vendor whose specialty is obtaining claims-related attending physician statements in foreign countries instead of utilizing agent-provided APSs.

There is also potential for collusion between agents and paramedic insurance examiners who service the foreign national market. A life insurance company may want to vet and establish a limited list of approved examiners for foreign national clients.

Life insurance companies vary in terms of the actual location where underwriting requirements are completed and what, if any, nexus to the United States is required. Requiring a substantive financial nexus to the US and completion of applications and underwriting requirements in the US is a more sound approach than the alternative. Focusing on “wealthy world citizens” may yield better mortality and persistency than offering coverage to non-wealthy foreign national clients. But whatever the client profile, underwriters should keep in mind that traditional requirements such as MIB, MVRs, pharmacy database checks, inspections, credit checks, criminal history checks, etc., often are of no protective value when underwriting foreign nationals.

Requiring a copy of the entire passport to better understand residence and travel may also be of help during the underwriting process.

Although underwriting foreign national markets presents distinct challenges, there are also opportunities. Knowing what to look for can be helpful, and the following points summarize the considerations to keep in mind:

- Focus on affluent clients.
- Establish sound means of verifying income and net worth.
- Develop familiarity with country-specific labor and compensation data.
- Develop an understanding of country-specific customs, laws and culture regarding definitions of income, contracts and ownership.
- Vet and oversee translation services and medical information providers.
- Realize traditional US market underwriting requirements may be of little or no value in underwriting foreign nationals.
- Study post-issue policy changes and premium sources to better understand the business.
- Consider requiring full copies of passports.

Red flags for potential money laundering in foreign national business include:

- Attempts to pay in cash.
- Payments from third parties.
- Recurring payments from multiple entities.
- Frequent premium overpayments accompanied by requests to send the refunds to a foreign address or unrelated third party.
- Surrender or maximum loan requests shortly after issue, without concern for surrender fees, and accompanied by a request to send proceeds to a foreign bank, business or address.
- Quick ownership change to a foreign address after issue.
- Disinterest in policy features and coverage specifics; instead, over-interested in surrender or cancellation terms.
About the Author
Keith Brown, FALU, MSM, CLU, ChFC, FLMI, RHU, has over 30 years of direct company and reinsurance underwriting experience and is Vice President, Risk Management & Chief Underwriter (Life, Disability Income & Critical Illness) for Gen Re’s Life/Health division in Stamford, CT.

From the 2017 ALU Exam Finalization Meeting in Charleston, SC: President Frank Goetz, FALU, Pacific Life Insurance thanks Coordinator Exam 202 Catie Muccigrosso, FALU, RGA Reinsurance for her years of service.

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ULCERATIVE COLITIS - THE GUT FEELING YOU GET WITH CRITICAL ILLNESS UNDERWRITING

Seema Samad
Senior Underwriter
LOGiQ³
Toronto
seema.samad@logiq3.com

What Is Ulcerative Colitis?
Ulcerative colitis is defined as a chronic disease of the colon (large intestine). Classified as an IBD (irritable bowel disease), it can often come with unpleasant side effects. IBD is not to be mistaken for IBS (irritable bowel syndrome), which carries a much lower mortality risk and can be assessed at standard rates for both life and critical illness insurance. Some of the factors to consider with ulcerative colitis is that it can be a very uncomfortable impairment to live with. Ulcers or open sores form in the colon on the inner lining of the bowel, causing inflammation, ulceration, bleeding and scarring along with a host of unpleasant symptoms. The symptoms are what can lead to complications. Complications in ulcerative colitis and the symptoms that go along with it can vary depending on the extent of inflammation in the rectum and the colon. The rectum is always involved, but can extend a variable distance up to and including the entire colon. The extent of the disease is a major factor during the underwriting. The major risk factor with ulcerative colitis is colorectal cancer, and regular screening with colonoscopies can help reduce the risk.

An estimated 1.6 million Americans and 250,000 Canadians are currently living with IBD. Canadians have one of the highest rates of IBD. And, 104,000 people are living with ulcerative colitis in Canada and 907,000 in the US.

Symptoms and Complications of Ulcerative Colitis
Ulcerative colitis is often accompanied by gas, bloating, cramping, abdominal pain, fatigue, diarrhea (possibly bloody) and loss of appetite. Because the body is disrupted in how it digests food, absorbs nutrition and eliminates waste in a healthy manner, a wide array of uncomfortable symptoms will accompany it. Complications of ulcerative colitis can include arthritis, eye inflammation, liver disease, osteoporosis, blood abnormalities, skin conditions, weight loss, anemia and colon cancer. The risk of cancer is much greater in individuals who have had ulcerative colitis for greater than 8 years with frequent flare-ups affecting the entire large intestine.

Treatment
Treatment of ulcerative colitis can be through medication or surgery. Medications include corticosteroids for acute flare-ups and 5-aminosalicylate (5-ASA) drugs for continuous relief. The course of treatment will be determined by the severity of the disease. A 5-ASA compound is typically used for mild to moderate severity. It is used to reduce inflammation and to maintain remission. Corticosteroids are used in combination for acute flare-ups and are not given long term because of the possible side effects.

Ulcerative colitis in a severe form would mean frequent hospitalizations and the inability to achieve
relief with corticosteroids. Treatment would then lead to immunosuppressants and/or surgery.

When removing the entire colon including the rectum (proctocolectomy), an ileostomy is created. An ileostomy is a stoma that is created when the ileum or small intestine is brought onto the surface of the skin allowing for waste to pass. Individuals who have had a proctocolectomy with ileostomy are cured of the disease. An alternate option is the ileo-anal pouch. The pouch is created internally using the ileum (small intestine) and connecting it to the anus after the colon and rectum are removed. With this option there is no need for an ileostomy. Surgical treatment is a curative approach and eliminates the risk of colon cancer.

Once the underwriter has all the information from the physician and applicant, the next step is to determine the degree of severity of the ulcerative colitis:

**Mild**
Disease restricted to rectum.
Intermittent diarrhea, 3-5 stools per day, no cramping.
No symptoms of fever, weight loss, fatigue.
Normal labs.

**Moderate**
1/3 to 1/2 of the colon is involved.
Gross blood and cramping with 5+ stools per day.
Intermittent symptoms of fever, anorexia, weight-loss, fatigue, anemia.
Development of severe dysplasia.

**Severe**
Complete involvement of the colon.
Toxic megacolon with intestinal perforation.
Some hospitalization due to severe episodes of bloody mucus diarrhea and fever.
Severe symptoms.
Abnormal lab results.

**Underwriting for Critical Illness**
The type of treatment alone often can underline the severity of the disease to the underwriter. Of course an APS will be obtained and necessary details of treatment and complications will be outlined by the individual's doctor.

Some red flags for CI in particular would include:
- Degree and compliance of follow-ups.
- Lab results - specifically abnormal serum protein or albumin, abnormal liver function tests.
- Celiac disease.

These specific occurrences play a major role in helping to distinguish categories and severity of the disease for CI underwriters.

While family history is a very important factor for CI underwriting, a family history of ulcerative colitis alone is not seen adversely.

However, family history of colorectal cancer, and genetic familial cancer syndromes of the colon such as FAP (familial adenomatous polyposis) and HNPCC (hereditary nonpolyposis colorectal cancer), need to be carefully considered. FAP is a dominant cancer syndrome. If this is not treated with a colectomy, cancer can develop prior to age 40. From 2-5% of colorectal cancer is caused by HNPCC. This is crucial information for CI underwriting in order to assess family history with either appropriate exclusions/declinations.

Fundamentally for CI, the main concern for underwriting those with a personal history of ulcerative colitis is the risk for colon cancer. If we have information suggesting that the individual has a mild form of ulcerative colitis, with a favourable number of years since the initial diagnosis, then CI can be quite attainable. Once we have determined the degree of symptoms, severity, type of treatment, current status and routine cancer surveillance, we can establish a case for individuals with ulcerative colitis.

Ultimately, we would like to keep the underwriting process moving along. When we have the information necessary to assess the CI risk, we can get the best outcome for ulcerative colitis cases.

**References**
Crohn’s and Colitis Canada available at www.crohnsandcolitis.ca.
Crohn’s and Colitis of Foundation of America available at www.ccfa.org.

**About the Author**

Seema Samad is responsible for production underwriting at LOGiQ³ for two of the company’s largest clients. She has 8 years of experience in the life insurance industry, having started as a tele-interviewer and quickly moving into an underwriting role for one of the top North American insurers. Seema’s background as a registered practical nurse in Ontario made her an ideal candidate for underwriting. She studied Nursing at Conestoga College and is an active member with the College of Nurses of Ontario. Seema consistently pursues continued education and describes herself a lifelong learner. She is currently located in Toronto.
GUIDING PRINCIPLES FOR THE UNDERWRITER

The Association of Home Office Underwriters and Canadian Institute of Underwriters endorse these Guiding Principles so as to:

- Make all of our members aware of the responsibilities of those who, directly or indirectly, practice or engage in the process of underwriting
- Clarify for consumers, legislators and regulators that the underwriting process includes principles which extend beyond any single individual's and/or company's self interest.

The Guiding Principles are presented, not to set specific standards for others to measure individual performance, but for the self-guidance of all those who are striving to understand and meet the responsibilities of an underwriter.

It is the responsibility of each underwriter to:

1. Act promptly, while exercising sound, objective and consistent judgment, in making underwriting decisions.
2. Follow established risk classification principles that differentiate fairly on the basis of sound actuarial principles and/or reasonably anticipated mortality or morbidity experience.
3. Treat all underwriting information with the utmost confidentiality and use it only for the express purpose of evaluating and classifying the risk.
4. Comply with the letter and spirit of all insurance legislation and regulations, particularly as they apply to risk classification, privacy and disclosure.
5. Avoid any underwriting action which is in conflict with the obligation to act independently and without bias.
6. Act responsibly as an employee with scrupulous attention to the mutual trust required in an employer/employee relationship.
7. Provide information and support to sales personnel to help them to fulfill their field underwriting responsibilities in selecting risks and submitting underwriting information.
8. Strive to attain Fellowship in the Academy of Life Underwriting, maintain a high level of professional competency through continued education, and help promote the further education of all underwriters.
9. Maintain the dignity and sound reputation of the Underwriting Profession.
10. Increase the public's understanding of underwriting by providing information about risk classification.
FROM THE 2017 ALU EXAM FINALIZATION MEETING

Putting together the Examinations: committee members review questions for 2017 exams.

OTR thanks Stan Meyer for his photos of the 2017 ALU Exam Finalization Meeting which appear in this issue.

FALU Quiz Answer Key:
1. d
2. d
3. b
4. c
5. b, (automatic reinsurance)
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