Overview
G2G attended NDIA’s Annual Military Medical Partnerships Conference March 7-8, 2017 in the D.C. area. Program Managers and leadership from all branches and research directorates discussed the military’s medical gaps and how the private sector can best approach partnering with the military to fill those gaps. The DoD researchers shared tips for industry on how to navigate what can be a challenging military medical system, using case studies of real businesses partnering with the DoD to show methods for success. G2G also had one-on-one conversations with program managers and key leadership and gathered information on funding priorities. Below is a list of the key contacts made and their top priorities, with a more detailed list below that, broken down by research area.

Key Contacts Made:
• Commanding General, USAMRMC—first female commander of MRMC, focused on innovation and collaboration with industry
• Director, Combat Casualty Care Research Program—emphasized non-compressible hemorrhage control as a top priority, which he always prioritizes, as well as trauma care
• Director, Clinical and Rehabilitative Research Program—extremity loss treatments and repair is a top priority, shared some RFI opportunities, highlighted below
• Program Manager, Pain Management—focused on non-narcotic pain management
• Program Manager, Neuromusculoskeletal Injury—neural regeneration is a top focus
• Director, Military Infectious Diseases Research Program—said not as much funding for this program as CCCRP, but working with WRAIR and focused on vaccines for a variety viruses
• Deputy for Acquisition, USAMMA—wants to improve transparency and communication between industry and MRMC
• Product Manager in Biomedical Engineering, USAMMA—interested in wearable sensors and portable imaging devices for far forward usage
• Deputy for Acquisition, USAMMDA—focused on drugs, regenerative medicine and tissue repair
• Product Manager, USAMMDA—burn care and vascular regeneration are top priorities
• Chief Medical Officer, Defense Innovation Unit Experimental—encourages industry to utilize DIUx to partner with DoD, casual process but need DoD pulling for the innovation
• Force Health Protection Lead Program Manager, US Air force—looking for DoD-wide solutions for data storage, management, and security
• Psychiatry and Neuroscience Professor, Uniformed Services University of the Health Sciences—Interested in sleep optimization and clinical decision tools for sleep
Key Takeaways:

- **USAMRMC Requirements** – USAMRMC makes all funding decisions based on requirements. It must develop requirements that list research priorities based on the diseases, infections, and wounds soldiers are experiencing in the field. They also look to industry and academia to see research capabilities that are available to help define those requirements. Therefore, your innovation must be a fit for a requirement. These requirements are also helpful in showing the FDA the gaps to pressure it to prioritize innovations that address those gaps.

- **FDA** – FDA is a data-driven organization, and while requirements and experience can tell a powerful story, innovations up for approval or clearance by the FDA must stand the test of data, trials, and evidence. DoD is very judicious when choosing to write letters of support to FDA for innovations, and prioritize life-saving innovations that need to make it to the field as soon as possible to fill significant gaps.

- **USAMMDA** – USAMMDA (which covers drugs, biologics and regenerative medicine) gets involved in the FDA process as soon as possible and recommends that private sector do the same. Start conversations to confirm appropriate pathways, develop relationships, and ask questions starting at early stages. All of this will help speed up the process and direct your business and activity to best prepare for success.

- **Army Research Lab (ARL)** – ARL created an Open Campus Initiative, which makes it easier to collaborate with researchers because barriers to entry often slow down productivity and collaboration. ARL most frequently sees innovations outside of the life sciences, but is increasingly looking to collaborate in this area. ARL specializes in innovations at phases 6.1 and 6.2, which represent basic and applied research phases.

- **Advanced Development** – Advanced development dollars, during phases 6.4 and 6.5, are often awarded to extramural researchers, as private sector has the infrastructure to bring final-stage products to market, then DoD will buy the final product through contracts and utilize in the field.

**USAMRMC’s Priority Areas:**

- **Non-Narcotic Pain Relief:**
  - Post-amputation pain is severe and complex due to pain from the remaining limb as well as phantom pain. This is particularly important for the military to work towards solving, especially with non-pharmacological solutions. Cleveland, Ohio company, NDI Medical/SPR Therapeutics, was highlighted for its work in this area with the military.

- **Trauma:**
  - Because trauma is an orphan indication, the military is looking for innovations that can rely on primary indications when going through the development process.
  - Hemorrhage and resuscitation remain the top priorities. They are seeking solutions that can be used as far forward as the battlefield that can help stop non-compressible wounds and extremities at risk of amputation, and head and neck hemorrhaging.
  - Restoration versus treating has shifted regenerative medicine to the forefront of rehabilitative medicine. Of particular interest is the regeneration of neurons in a functional way, especially to treat pain and extremity loss.
Due to limited knowledge of burn treatment in the field, there is a strong need for solutions that untrained medics can use to treat the full-body response that burn victims face during blasts.

**Vaccines:**
- DoD is currently putting in a large amount of money into vaccines for a range of viruses, especially for influenza. Vaccine work occurs at Military Infectious Disease Research Program (MIDRP) and Walter Reed Army Institute of Research (WRAIR).

**Infectious Disease:**
- Currently, infectious disease research obtains less funding because the highest mortality and morbidity rates of soldiers returning from the field is from wounds and TBI.
- An ever-changing health landscape and the realities of the austere battlefield require DoD to be agile. When investing in innovation, solutions must match current needs, but be adaptable where possible. Building relationships with program managers in low or under-funded programs now could position candidates well, if and when new funding emerges.

**Neurotrauma and Psychological Health:**
- Looking for novel biomarkers for prognosis, diagnosis, and treatment efficacy.
- Precision medicine is a new focus in neurotrauma care because the DoD is looking how to incorporate genetic predisposition into the diagnosis and treatment of TBI.
- Blast-injury TBI had a specific focus at this conference. Within this space, the top knowledge gaps include: insufficient evidence to suppose specific injury mechanisms of blast-induced mTBI so need to develop and validate testing models; sensor technologies are more advanced than the current understanding of mTBI so need to increase information sharing in the biomedical communities; and lack of scientific evidence linking blast related TBI to Chronic Traumatic Encephalopathy so longitudinal research, identification of biomarkers, and standardization of diagnostic criteria are extremely important.
- Psychological health gaps center mainly on PTSD and identifying sub-categories of PTSD, with suicide prevention a high second priority. Treatments and preventions of PTSD, especially incorporating the pathophysiology of PTSD using neuroimaging, genetics/genomics, and physiological measures, are of strong interest.

**Medical Devices:**
- Ocular salvage devices are a gap in military medical R&D.
- Portable wearable sensors that are lightweight, can be used on a healthy soldier and be useful during emergency situations, and can measure hypoxia, vitals, and other physiological measurements are all top priority. The DoD is currently working on finalizing requirements for vital signs monitoring now.
- Looking for portable diagnostic devices, including imaging systems that can be used as far forward as possible.
- Reduction of weight, space, and cost for items and outfits that soldiers carry and use to treat injured peers on the field is an essential component of innovations supported by the DoD.
- DoD looks to modernize existing medical devices that are obsolete or discontinued.
Health IT and Mobility:
- Telehealth is quickly coming to the forefront of medical R&D, especially solutions that focus on cyber security and provide decision-making tools to untrained medics in stressful, austere situations.
- Medical evacuation is essential for many severely injured soldiers. Innovations that make that process safer and more effective for soldiers is of the utmost importance to improving en route care.

Tips for Collaborating with DoD:
- **CRADAs** are very important, as they are the start to a relationship that could fast-track funding opportunities once those key relationships are developed. Key leadership stressed that simply submitting a proposal has a small chance for success, but relationship building, speaking to program managers to learn requirements and unmet needs, and developing research relationships through CRADAs will increase funding chances significantly.
- DoD is prioritizing funding innovations that have the potential to apply to unmet needs in civilian healthcare, as those innovations will need to stand the test of profitability, reimbursement, and insurance. The DoD relies on industry to help bring life-saving products to market. The larger the market, the more funding that research will get from the DoD.
- **DIUx** was created 1.5 years ago to facilitate rapid contracting with the DoD to solve key issues in the fields of: Networking and Security, Systems & Analytics, Life Science, Aerospace, Autonomy, and Artificial Intelligence. DoD found that they were far behind commercial R&D by 3:1 and wanted to find a way to better leverage the infrastructure and efficiency of industry. Specific DoD needs to be filled are listed in DIUx’s Commercial Solutions Opening (CSO). If interested, DIUx will respond to those who submit within 30 days. So far, DIUx has facilitated 20 contracts totaling $43 million, and work mainly with innovations at TRL 3. They are currently working with CCCRP and focused on trauma care.
- It is important to work with physicians and medical professionals other than laboratory researchers. If physical therapists, occupational therapists, nurses, or any other specialist deal with patients every day and can speak to clinical gaps, they are key partners when developing innovations.
- When considering your innovation for the DoD, consider the healthcare continuum. Understanding the different points of care, the needs at each of those points, and the logistical issues that prevent certain innovations from succeeding in austere environments can help direct innovations to the appropriate audience.