The Vascular Medicine Program (VMP) “A paradigm shift from individual to group research at AUB”

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American University of Beirut
Developing a Multidisciplinary Model of Comparative Effectiveness Research Within a Clinical and Translational Science Award

Abstract

The Clinical and Translational Science Awards (CTSAs) were initiated to improve the conduct and impact of NIH's research portfolio, transforming training programs and research infrastructure at academic institutions and creating a nationwide consortium. They provide a model for translating research across disciplines and offer an efficient and powerful platform for comparative effectiveness research (CER), an effort that has long struggled but enjoys renewed hope under health care reform. CTSAs include study design and methods expertise, informatics, and regulatory support; programs in education, training, and career development in domains central to CER; and robust programs in community engagement, both of the general public and of clinical practice communities.
Strengthening the Career Development of Clinical Translational Scientist Trainees: A Consensus Statement of the Clinical Translational Science Award (CTSA) Research Education and Career Development Committees

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Abstract

The challenges for scholars committed to successful careers in clinical and translational science are increasingly well recognized. The Education and Career Development (EdCD) of the national Clinical and Translational Science Award consortium gathered thought leaders to propose sustainable solutions and an agenda for future studies that would strengthen the infrastructure across the spectrum of pre- and postdoctoral, MD and PhD, scholars. Six consensus statements were prepared that include: (1) the requirement for career development of a qualitatively different investigator; (2) the implications of interdisciplinary science for career advancement including institutional promotion and tenure actions that were developed for discipline-specific accomplishments; (3) the need for long-term commitment of institutions to scholars; (4) discipline-specific curricula are still required but curricula designed to promote team work and interdisciplinary training will promote innovation; (5) PhD trainees have many pathways to career satisfaction and success; and (6) a centralized infrastructure to enhance and reward mentoring is required. Several themes cut across all of the recommendations include: team science, innovation, and sustained institutional commitment. Implied themes include an effective and diverse job force and the requirement for a well-crafted public policy that supports continued investments in science education. Clin Trans Sci 2012; Volume 5: 132–137
WHY IS VASCULAR MEDICINE AN IDEAL TARGET FOR TEAM SCIENCE?
WHY IS VASCULAR MEDICINE AN IDEAL TARGET FOR TEAM SCIENCE?

...BECAUSE BIG PROBLEMS NEED BIG SOLUTIONS
Non-communicable diseases (NCD), which include CVD, account for approximately two thirds of world deaths.
LEBANON: THE BURDEN OF VASCULAR DISEASE

Proportional mortality (% of total deaths, all ages)*

- CVD: 45%
- Cancers: 19%
- Other NCDs: 13%
- Diabetes: 2%
- Respiratory diseases: 5%
- Communicable, maternal, perinatal and nutritional conditions: 7%
- Injuries: 9%

NCDs are estimated to account for 84% of all deaths.
### Risk factor analysis: Lebanon

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Males</th>
<th>Females</th>
<th>Both sexes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current cigarette smoking</td>
<td>46.81%</td>
<td>31.6%</td>
<td>38.5%</td>
</tr>
<tr>
<td>Current arguileh smoking</td>
<td>23.3%</td>
<td>21.6%</td>
<td>22.4%</td>
</tr>
<tr>
<td>Low level of physical activity</td>
<td>52.4%</td>
<td>40.3%</td>
<td>45.8%</td>
</tr>
<tr>
<td>Not engaging in vigorous physical activity</td>
<td>76.9%</td>
<td>90.6%</td>
<td>84.5%</td>
</tr>
<tr>
<td>Never measured blood pressure</td>
<td>20.4%</td>
<td>12.6%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Previously diagnosed with raised blood pressure or hypertension</td>
<td>13.2%</td>
<td>14.2%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Never measured blood sugar</td>
<td>36.2%</td>
<td>24.2%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Previously diagnosed with raised blood sugar or diabetes</td>
<td>7.2%</td>
<td>4.8%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Ever diagnosed with raised cholesterol</td>
<td>18.0</td>
<td>15.2</td>
<td>16.5</td>
</tr>
</tbody>
</table>
Lebanon/MENA:
Smoking (including Arghile)
Other Inhaled Oxidants
(pollution; generator fumes…)

“Oxidant” Membrane Injury

Inflammation

ORGAN DYSFUNCTION
OVERT DISEASE

TIME

• Oxidant Stress
• Inflammation
• Hemodynamic
ENDOTHELIAL INJURY
Oxidant Stress
• Inflammation
• Hemodynamic
ENDOTHELIAL INJURY

“Oxidant” Membrane Injury

Inflammation

Hemodynamic Membrane Stress

+ ORGAN DYSFUNCTION OVERT DISEASE

TIME
THE PATHOPHYSIOLOGY SHOULD DICTATE TARGETS FOR INTERVENTION

- Oxidant Stress
- Inflammation
- Hemodynamic Endothelial Injury

“Oxidant” Membrane Injury

Hemodynamic Membrane Stress

Inflammation

Prevent/Treat Hypertension

Organ Dysfunction Overt Disease

Cut Smoking
Cut Pollution

Time
VASCULAR MEDICINE PROGRAM at the American University of Beirut
What is the Vascular Medicine Program

• A collegiate cross-campus multi-unit entity
• Participating units: Faculty of Medicine, Faculty of Health Sciences, Faculty of Agricultural and Food Sciences, Faculty of Engineering and Architecture, the Rafic Hariri School of Nursing and AUBMC.
• This includes the participation of fifteen departments and more than eighty faculty members.
VMP-EXECUTIVE COUNCIL

• Kamal Badr  
  FM/Director
• Hussain Ismail  
  FM/co-Director
• Robert Habib  
  FM/co-Director
• Lara Nasreddine  
  FAFS
• Nathalie Zgheib  
  FM
• Elie Akl  
  FM
• Imad El Hajj  
  FEA
• Dany Badreddine  
  Heart and Vascular COE
• Carla Makhlouf  
  FHS
• Mohamad Al Medawar  
  Admin/web page coord.
• Alain Rizkallah  
  FM/Research fellow
• Laila Al Shaar  
  Data Manager
VMP: Goals

• Adopt and institute clinical protocols for the screening and evaluation of vascular diseases at AUBMC
• Unify evidence-based guidelines for the treatment of vascular diseases at AUBMC
• Develop and implement mechanisms for tracking and evaluating patient and physician compliance with evidence-based practice in the prevention and treatment of vascular disease
• Upgrade current resources in IT and diagnostic/therapeutic technologies in vascular diseases, including outpatient monitoring/follow-up and novel therapeutic interventions
• Develop basic, translational, clinical, and population-based research programs among participant entities
• Increase awareness and educating physicians, trainees, and the public in regards to screening for and diagnosing vascular disease in children, adolescents, young adults and asymptomatic individuals
• Advocate for policy changes which promote vascular health, and also start organizing an annual AUB-hosted International Meeting on Vascular Biology and Health and joint academic and CME activities among participant entities.
Objective 1: Adopting and instituting clinical protocols for the screening and evaluation of vascular diseases at AUBMC.

Objective 2: Unifying evidence-based guidelines for the treatment of vascular diseases at AUBMC.

Objective 3: Developing and implementing mechanisms for tracking and evaluating patient and physician compliance with evidence-based practice in the prevention and treatment of vascular disease.

Implemented Activities:

Initiating A Hypertension Clinic

- A unified approach to HTN management
- AUB-MC as a European Certified Center of Excellence for treating HTN
- HTN lab
- RN role, dietitian role and logistics of the clinic have been defined.

Supporting The Heart and Vascular Clinical Science Conference: a multidisciplinary meeting (adult and pediatric Cardiology, Cardiothoracic Surgery, Vascular Surgery):

- Discuss common clinically relevant topics in cardiovascular medicine.
- Unify evidence-based guidelines for the management of cardiac and vascular diseases at AUBMC.
- Promote exchange of expertise and stimulate research ideas.
- Usually held the first Wednesday of every other month at 6 PM.
VMP: Accomplishments II

Objective 4: Upgrading current resources in IT and diagnostic/therapeutic technologies in vascular diseases, including outpatient monitoring/follow-up and novel therapeutic interventions.

Implemented Activities

• Developing Electronic Data Collection Forms
• Joint Collaboration with the Cardiology Division at AUBMC and Outcomes Research Unit
• Expanding IT “footprint” outside AUB: Cardiovascular Analysis and Research Enterprise (CARE)-Lebanon and YADUNA

The Vascular Medicine Program has prepared a proposal to pharmaceutical companies to collaborate and establish electronic data collection forms in five hospitals in 4 Mohafazat of Lebanon (1 in North, 1 in South, 1 in Beqaa, and 2 in Mount of Lebanon).
VMP: Accomplishments III

**Objective 5:** Developing basic, translational, clinical, and population-based research programs among participant entities.

- Recruitment of a national representative cohort of the Lebanese population for the Vascular Medicine Program
- Determining PWV and salt excretion rates in Lebanese population
- Reactive oxygen species (ROS) Program Project Grant Group
- Bisphenol A and cardiovascular (CV) disease in the Lebanese population.
- Determining the impact of Narghile smoking on coronary artery calcium and large artery stiffness measured by Pulse Wave
- Vit D/K group
- SHARP participation
- “SHARP II” with Vanderbilt
Objective 6: Increasing awareness and educating physicians, trainees, and the public in regards to screening for and diagnosing vascular disease in children, adolescents, young adults and asymptomatic individuals.

- Research retreat - February 2012
- 45th Middle East Medical Assembly - May 2012
- Salt Awareness Raising Activities

Objective 7: Advocating for policy changes which promote vascular health.

- LASH group is launching an awareness campaign promoting the reduction of salt intake in the Lebanese cuisine.
Late effects of radial artery vs saphenous vein grafting for multivessel coronary bypass surgery in diabetics: a propensity-matched analysis

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Primary carnitine deficiency: novel mutations and insights into the cardiac phenotype


Solute carrier family 22 member 5 (SLC22A5) encodes a sodium-dependent im transporter responsible for shuttling carnitine across the plasma membrane. This process provides energy for the heart, among other organs allowing beta-oxidation of fatty acids. Mutations in SLC22A5 result in primary carnitine deficiency (PCD), a disorder that manifests with cardiac, skeletal, or metabolic symptoms. We hereby describe two novel mutations in SLC22A5 in two Lebanese families associated exclusively with a cardiac phenotype. The frequency of the mutations and...
Papers Submitted

* Increased late mortality following coronary artery bypass surgery when complicated by isolated new onset atrial fibrillation: a comprehensive propensity-matched analysis.
Laila Al-Shaar, Thomas A. Schwann, Ameer Kabour, Robert H. Habib.

* Improved Accuracy of Anticoagulant Dose Prediction using a Pharmacogenetic and Artificial Neural Network Based Method
Hussain A Isma’eel, Dr. George E Sakr, Robert H Habib, Mohamad Musbah Almedawar, Nathalie K Zgheib, Imad H Elhajj

* Waterpipe smoking and angiographically determined coronary artery disease: a case control study
Abla M Sibai, Rania A Tohme, Taha Itani, Eden A Nohra, Mohamad M Almedawar, Hussain A Isma’eel.

* Dose Requirement to Raise 25-Hydroxyvitamin D to Desirable Levels in Adolescents: Results from a Randomized Controlled Trial.
Laila Al-Shaar, Rania Mneimneh, Mona Nabulsi, Joyce Maalouf, Ghada El-Hajj Fuleihan

* Hypovitaminosis D in a Sunny Country: Time Trends, Predictors, and Implications for Practice Guidelines.
Maha Hoteit*, Laila Al-Shaar*, Cynthia Farah, Maria Bou Sleiman, Tala Ghalayini, Ghada El Hajj Fuleihan. * are co-primary authors.

* Quantifying the impact of using Coronary Artery Calcium Score for risk categorization instead of Framingham Score or European Heart Score in lipid lowering algorithms.
Accepted Abstracts


* Almedawar M, Harbieh B, Al-Ajaji W, Abchee A, El-Merhi F, Hourani M, Khoury N, Alam S, Al-Shaar L, Badr K, Isma’eel H: **Coronary Artery Calcium Score significantly alters treatment indications in comparison to European and Framingham risk scoring systems among stress test negative patients**, 3rd Annual AUB Biomedical Research Day 2013 and in Lebanese Medical Students' International Committee (LeMSIC) Research Day 2013


The Vascular Medicine Program (VMP) at AUB functions as a multidisciplinary unit that utilizes numerous clinical and research resources across campus, directed to promote vascular health and reduce the burden of cardiovascular diseases in Lebanon and the region. We are particularly focused on actionable strategies developed through basic and translational research tightly coupled to high-impact advocacy initiatives.

About the Vascular Medicine Program
The Vascular Medicine Program (VMP) at AUB functions as a multidisciplinary entity and utilizes numerous resources and areas of expertise across campus. To date, the participating faculties and units are:
- Faculty of Medicine
- Faculty of Health Sciences
- Faculty of Agricultural and Food Sciences
- Faculty of Engineering and Architecture
- The Rafic Hariri School of Nursing
- AUBMC
  - Nursing Services
  - Clinical Diabetology

This includes the participation of fifteen departments and more than eighty faculty members.

Active Groups
- Sodium and Hypertension - Lebanese Action on Salt and Health
- Carotid-Vitamin D-Vitamin K and Vascular Disease
- Smoking/Reactive Oxygen species and Vascular Inflammation
- Biophosphol 4 and its effects on Health

News and Updates
- The LASH group holds the salt intake reduction booth at the Healthy Heart Fair on Sunday, December 9, 2012, to raise awareness on salt intake and distribute the Low Salt Shopping Guide. Read More

VMP Website
www.vmp.aub.edu.lb
VMP: CHALLENGES

1. Reluctance of clinical faculty to share resources/turf.
2. Reluctance of faculty to share research material
3. Silos in management of hypertension (nephrology; cardiology; endocrinology; family medicine)
4. Absence of stroke service
5. Funding