NEW ACADEMIC UNIT — APPROVAL REQUEST

See Guidelines for Requesting Academic Unit Changes for Renaming, Mergers, Transferring or Disestablishment of an Existing Academic Unit

I. Campus and Location Offering – indicate by highlighting in yellow the campus(es) and location(s) where this academic unit will reside.

<table>
<thead>
<tr>
<th>UA South Campus</th>
<th>UA Main</th>
<th>Phoenix Biomedical Campus</th>
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<tr>
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<td>Douglas</td>
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<td>Distance Campus</td>
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<td>Paradise Valley</td>
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<td>UA Science and Tech Park</td>
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II. Academic College—Provide the name of the academic college where this unit will be housed.

College of Medicine - Tucson

III. Purpose and Activities of the Unit

A. Identify the basic goals and objectives of the new unit.

Statement of Need

The University of Arizona has long taken pride in its role providing the people of Arizona with the highest level of care. Commensurate with this goal is the need to deliver optimal care to patients with neurological disease requiring surgical intervention. This effort requires a full range of capabilities from the routine to rare subspecialty services. The Department of Neurosurgery at the University of Arizona must be strongly positioned to serve not only the greater Tucson area, but also the entire Southwest region.

Mission Statement

The Department of Neurosurgery at the University of Arizona will provide the highest level of neurosurgical care in all services and subspecialties. We will advance the state of knowledge and practice through research and innovation, from “bench-to-bedside”. We will ensure the future of this medical art and neuroscience health in Arizona through education. In keeping with the sentiments of the State of Arizona Motto, "Ditat Deus", we will seek to enrich the lives of all those who pursue health or knowledge to serve our community and beyond.
The impetus behind the creation of the Department of Neurosurgery is to:

1. Insure the upward growth and stability of the neurosurgery program at a time when the Department of Surgery at the University of Arizona has stabilized and is growing.
2. Better facilitate the BUMC-T Neuroscience Product Line implementation.
3. Contribute to future neurosciences collaborations throughout the Banner Health Network.
4. Develop stronger synergies with the newly created University of Arizona Center for Innovation in Brain Science.
5. Increase Neurosurgery's organizational profile in strategic and leadership groups.
6. Support retention of key faculty leaders vulnerable to recruitment.
7. Strengthen the ability to recruit new faculty, including those challenging positions such as pediatric neurosurgery and physician-scientists.
8. Augment recruitment of the top medical students to the residency program.
9. Better position the academic and research programs on a national level.
   - 87% of ERAS-listed Neurosurgery residency programs are departments.
10. Reconcile with previous Department of Surgery external reviews:
    - "Consideration should be given in the future to provide department status to ENT and Neurosurgery."—2003 Department of Surgery Academic Review
    - "Urology and Neurosurgery . . . are commonly stand-alone departments."—2010 Department of Surgery Academic Review

Objectives

Neurosurgery at the University of Arizona will organize around four pillars of academic medicine:

1. To deliver patient-centered care that serves as a national model for clinical excellence.
2. To provide outstanding undergraduate, graduate and post-graduate education that teaches evidence-based medical/surgical patient care and current principles in prevention, detection, treatment, and rehabilitation of neurosurgical diseases. The goal of educational preeminence will be fostered by inculcating the values of professionalism in all of our students.
3. To perform basic, translational, and clinical investigation that advances the neurosciences with an emphasis on research and innovation.
4. To offer administrative leadership and fiscal responsibility, to the benefit of not only the Department of Neurosurgery, but also the institution as a whole.

Each of these will inform and influence the others so that all aspects of the Department will develop synergistically.

B Describe the activities, projects, and programs that will be conducted by the new unit.

Clinical Care

Comprehensive clinical excellence will only be achieved when the Department can offer the highest level of care for all routine as well as rare and complex neurological disease processes. We serve a Southern Arizona catchment of up to 1.5 million lives. Additionally, we draw from the greater Southwestern region with Western United States and international contribution.

To accomplish this goal, Neurosurgery must recruit and retain faculty with highly refined skill-sets. The plan will call for the development of faculty and resources that will nullify any need
to outsource patient care from the Banner University Medical Center Tucson (BUMC-T). We are already well along this path, maturing our existing service lines (spinal neurosurgery, epilepsy surgery, neurotrauma, skull base surgery, neurovascular surgery), and working to develop new subspecialty products (pediatric neurosurgery). Our clinical volumes over the last 9 years reflect the success of our strategy:

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* 6-month totals from Jan – Jun 2018, † EMR & clinic relocation data skewed

We must also recruit and retain an appropriate number of neurosurgical generalists to address the "bread and butter" business of neurosurgery as the Department grows. We must foster good relationships within the local community and ensure a collaborative partnership for the delivery of subspecialty care to the region. At this time, we have 5 FTE neurosurgeons employed within the Division of Neurosurgery (actively negotiating with a 6th, approved FTE). All these faculty members are certified by the American Board of Neurological Surgeons and have advanced fellowship subspecialty training.

We currently offer the following neurosurgery subspecialties:
- Surgical Neuro-oncology, including Skull Base Surgery
- Neurovascular Surgery, including endovascular intervention
- Spinal Neurosurgery, including deformity correction, minimally-invasive, degenerative disease, and spinal oncology
- Epilepsy surgery, including minimally-invasive, laser-assisted procedures
- Pain modulation neurosurgery
- Neuromodulation, including deep brain stimulation for movement and psychiatric disorders
- Peripheral nerve surgery
- General neurosurgery

Clinical development in neurosurgery has augmented the growth of existing ancillary services including medical imaging and electrophysiological monitoring. Multidisciplinary team development has also been emphasized. We now provide neuro-oncologic, neurovascular, spinal, epilepsy, and neuromodulation care that reaches across several disciplines and departments including Neurosurgery, Neurology, Radiation Oncology, Neuroradiology, and Trauma/Acute Care Surgery services to name a few. Departmental status will facilitate implementation of the Banner Neuroscience Service Line through better collaboration and equity with other key departments including our logical neuroscience partners in the Departments of Neurology and Psychiatry.

At our affiliated local Veterans Administration Hospital (SAVAHSC) we have 3 neurosurgeons who are considered integrated faculty and supervise a dedicated 6-month resident rotation. We are formalizing our academic affiliations with the 2 pediatric neurosurgeons at Banner
Cardon Children’s Hospital within the greater Banner Health Network. Our residents also rotate there for 6 months. An additional 2 community neurosurgeons regularly participate in neurosurgical care or teaching with our Division. To deliver the highest level of care 24/7 we also rely on a full complement of neurosurgical residents, 2 nurse practitioners (1 inpatient, 1 outpatient).

Potential recruitment of additional Pediatric Neurosurgery subspecialists for the Banner system (including a dedicated specialist for Tucson) will be pursued as resources and University of Arizona/BUMC-T strategic aims allow. Additionally, 2-3 physician extenders to support the neurosurgery clinics and inpatient operations will maximize patient access and throughput, especially now that the clinics are removed several miles up the road from the main hospital. Neurosurgery may further improve patient care by creating service lines that link physician and allied health services in meaningful ways, such as with Institute models. Lastly, when a critical mass of neurosurgeons is reached to cover all general and subspecialty clinical obligations, we will consider recruiting Neurosurgeon-scientists to augment our research standing.

Our clinical reputation is reflected in a recent 2016-2017 US News and World Report that recognized Neurology and Neurosurgery at the Banner University Medical Center – Tucson as the only high-performing hospital in Tucson for that category. Despite a disruptive year (new EMR, new Deans/Chairs, new clinics), in the 2017-2018 rankings we scored only a few points below our previous score. The creation of a new Department of Neurosurgery will let us continue this history of excellence and allow us to be compared with our Departmental cohorts nationally. Our ultimate clinical goal is regional, national, and international recognition for outstanding patient care and outcomes. This will be reflected in increasing patient referrals, visits, operations, and metrics demonstrating good/excellent patient outcomes and experiences.

Some acknowledgement must be made of the ever-changing and fluid neuroscience marketplace in Arizona. The competitive situation in Phoenix and the recent leadership transitions at the Barrow Neurological Institute offer the opportunity for the neurosciences at Banner University Medical Center in Tucson to assume a more prominent role in Arizona and the Southwest, both within and beyond the Banner Health Network. Departmental status will allow Neurosurgery at the University of Arizona to be competitive in the coming market.

Education

The teaching mission for the Department of Neurosurgery will depend first and foremost upon clinical activity since it is through the actual delivery of care that young professionals are best trained. By developing the critical neurosurgical subspecialties alongside general practice, we have been able to train our students in all aspects of neurosurgical care, including 1 year of dedicated research. The curriculum includes didactic and clinical learning within the apprentice-based Halsteadian model. Education is scaled from medical student to resident to fellow. We maintain regional associations for specialty education such as our elective rotations at the Southern Arizona Veterans Administration Health Sciences Center (Tucson, AZ), Cardon Children’s Hospital (Mesa, AZ), Barrow Neurological Institute (Phoenix, AZ), and Phoenix Children’s Hospital (Phoenix, AZ).

The presence of a neurosurgery residency remains a high prestige indicator for the University of Arizona. Recent match data (NRMP) from 2018 show that neurosurgery is among the most competitive training specialties. The ACGME accredited residency program in neurosurgery at the University of Arizona was initially approved in 2003 and has graduated 7 neurosurgeons since its inception. The program takes, on average, one resident per year. We
successfully applied for an extension of the program length from 6 to 7 years in 2012. Yearly we review over 200 applications (and interview 30-40) for our one position and we have secured candidates from our top 7 listed for the last 7 years. Clear markers of our success include:

- Fully ACGME-accredited residency program (approved 2003)
  - 1 resident per year for 7 years
- Successful petition for complement increase (2012)
  - From 6 year to 7-year program, 1 resident per year
- Successful site review (2012) with 10-year next accreditation system site review
- Successful resident match all years (2010 – 2018, *program out of official match 2013)
  - Secured candidates from #7 ranked or higher
  - AY2016: 224 applied, 68 invited, 29 interviewed, 1 matched (Ranks:Fill = 3)
  - AY2017: 214 applied, 71 invited, 30 interviewed, 1 matched (Ranks:Fill = 5)

- Residency diversity
  - Averages for US active neurosurgeons (Women ~8%, African Americans ~4%)
  - Graduated
    - 2 Women (25%)
    - 2 Latin American (25%)
    - 1 African American (12.5%)
  - Matriculated
    - 3 Women (15.8%)
    - 4 Latin American (21.1%)
    - 1 African American (5.3%)

Among national neurosurgery programs, the majority educate two or more residents per year. In order to grow the academic stature of the program, we will need to expand the residency program. It is our goal to grow this program to 1.5 residents per year by 2020 and 2 residents per year by 2025. We believe our projected medical/surgical volumes can easily support these objectives.

Neurosurgery at the University of Arizona has a long history of developing world-class educational resources for our residents. Dr. Allan Hamilton currently serves as the director of the Arizona Simulation Technology and Education Center (ASTEC). Dr. Hamilton was the former chief of the Division of Neurosurgery (1995 – 2004) and later, the chair of the Department of Surgery (1999 – 2004). We continue our collaborations with Dr. Hamilton to offer our residents the most cutting-edge surgical training and simulation. In addition, we introduced an International Visiting Scholar and Spine Research Fellowship programs (2012) with participants from the United Arab Emirates, and Italy. We have also created a multi-institutional spine fellowship program in collaboration with the Barrow Neurological Institute. The first fellow for this program is one of our own (enfolded) UA residents. The ultimate goal will be to obtain official accreditation - Committee on Advanced Subspecialty Training (CAST) by the Society of Neurological Surgeons (SNS) - for that fellowship in the near future.

We have also secured critical laboratory space within the College of Medicine to house our neurosurgical anatomy laboratory. We share this facility with the Department of Otolaryngology. In this space, we offer educational cadaveric courses as well as perform translational research. The considerable effort that went into this facility reflects our commitment to neurosurgical resident education.
The Neurosurgery Division faculty currently serve as educators and mentors to UA medical students. Learners from the University of Arizona Campuses in Tucson and Phoenix regularly rotate with the service. From 2009 to 2018 we have seen steady increase and sustain in the number of medical student rotators on our service. Our faculty maintains regular interactions with medical students, offering lectures and involving them in research and publication.

We also have recently formalized our “shadowing” program for undergraduates and even high school students with prescient neurosurgical interests. The faculty give regular lectures to these student and other interest groups. Several faculty members also serve on thesis boards for graduate students at the University of Arizona and other major universities. The Division of Neurosurgery is also a teaching resource for Dr. Marlys Witte’s NIH High School/Undergraduate Student Research Program (supported by NIINDS and NHLBI funding). All these efforts constitute our significant outreach commitment to a broad range of student/learners with growing interest in the neurosciences.

Research

Simply delivering the standard of care will not be sufficient for the Division of Neurosurgery at the University of Arizona. We must continually advance the field through research and innovation. Our efforts span the gamut from bench research to translational studies to clinical protocols. We have recruited faculty with specialized research interests and coordinated these with local resources. Additionally, we have secured the position of a research coordinator for the Division which has greatly facilitated our study coordination, grant applications, and published output.

Our efforts over the last 9 years have been rewarding in this regard. Emphasis has been placed upon external sources of funding to sustain research efforts. In keeping with the educational mission and its overlap with research, all residents and students are given the opportunity to select a mentor within the University to develop a project. A full year of residency training is dedicated to advanced training and/or research tailored to the resident’s needs and interests. Publication requirements have encouraged academic inquisitiveness as well as establish the University’s reputation for productivity. Since 2009, neurosurgery faculty, residents, and staff have generated 275 peer-reviewed publications. This is reflective of an environment supportive of academic and research activities.

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The Division of Neurosurgery at the University of Arizona has successfully secured funding from a variety of extramural sources. Present funding for projects by the Division of Neurosurgery (including UA co-investigators from other units) currently totals more than $4.5 million.
• Active funding for Neurosurgery (including UA co-investigator funding): $4,514,474.94
  o Federal ($3,379,541), including:
    ▪ Department of the Army – USAMRAA, multi-institutional study
      • Cerebrospinal Fluid Drainage and Induced Hypertension to Improve Spinal Cord Perfusion in Acute Spinal Cord Injury, Phase 2B Randomized Controlled Trial: $65,926.00 (grant total: $1,653,933.77)
    ▪ NIH R01 (NS102220-01A1), multi-departmental study
      • Development of high-speed and quantitative neuro MRI technologies for challenging patient populations: $2,143,615
    ▪ NIH R24, multi-departmental study
      • High resolution electrical brain mapping by real-time and portable 4D Acoustoelectric Imaging: $1,170,000.00
  o Industry Sponsored (~$940,000):
    ▪ Penumbra Inc., Boston Scientific Corp., Vertex Pharmaceuticals Inc., InVivo Therapeutics
  o Intramural (~$200,000), including:
    ▪ Clinical Research Oversight Council (CROC) – UACC
    ▪ Improving Health Technology Research Initiative Fund (TRIF) – UA
    ▪ Tech Launch Arizona Grant
    ▪ Department of Surgery Seed Grant

• Future Research goals
  o Increase the NIH, federal, and industry funding, secure surgeon-scientist
  o To establish collaboration and be fully integrated with the new UA Health Sciences Center for Innovation in Brain Science

Moving forward, neurosurgery departmental status will be critical to establish peer-based relationships with our University of Arizona research counterparts, such as the Center for Innovation in Brain Science. As a clinically active group with strong research interests, a Department of Neurosurgery will play an important translational role to advance many basic science innovations developed at the University advancing the Arizona Health Science Center's strategic concentration on Neuroscience. Neurosurgery must be afforded equal footing with such partners as neurology and psychiatry when designing and executing collaborations.

Research areas of interest
The current research interests of the Division of Neurosurgery are in translational science, clinical trials, new technology, and performance indicators as they pertain to spine, spinal cord injury, epilepsy, cranial nerve monitoring, brain tumor markers, gait and balance in patients with Parkinson’s disease, laser treatment for epilepsy and movement disorders, and the use of advancement technologies in neuromodulation, and surgical treatment of stroke. It is important to note that the Division has a rich portfolio of investigator-initiated research, including small-scale clinical trials, prospective studies, retrospective analyses, and humanitarian use device trials.

Most significant contributions
1. Establishing the Neuroscience Biorepository with the Arizona Biosignatures Laboratory Exchange with the goal to store all bio specimens collected at the time of surgery, including tissue, blood and CSF from a variety of pathologies, including cancer,
vascular disease, degenerative processes and even non-pathological tissues as clinically indicated for current and future studies. De-identified samples are available to all members of the neuroscience research community.

2. As a measure of the value of neurosurgery academic research activity, ingenuity and collaboration with the Arizona Tech Transfer office and industry, several patents have been filed by neurosurgery residents and faculty:

Significant Funding

• Intramural Funding represents an important seed-source for initial projects and represents critical support and confidence from the parent institution for nascent research efforts. Important past and current efforts include:

   o Diffusion basis spectrum imaging with extended isotropic spectrum for differentiation between tumor recurrence and radiation necrosis in treated gliomas
     Source: Clinical Research Oversight Council (CROC), University of Arizona Cancer Center
     Role: Co-Investigator (Lemole)
     Amount: $46,135
     Status: 2017 – 2019 (active)
   o Kallikrein-6 Activity Probe for Image-Guided Resection of Brain Tumor
     Source: University of Arizona- Improving Health Technology Research Initiative Fund (TRIF)
     Role: Co-Investigator (Lemole)
     Amount: $100,000
     Status: 2017 – 2018 (active)
   o Realtime Reflex Pupillometry Device for Neuro-physiologic Monitoring
     Source: Tech Launch Arizona (ID UA15141)
     Role: Co-Principal Investigator (Lemole)
     Amount: $37,588
     Status: 2016 – 2018 (active)
   o Direct measurement of current flow from deep brain stimulation electrodes using magnetic resonance electrical impedance tomography
     Role: Principal Investigator (Kasoff)
     Source: Department of Surgery Spring Faculty Seed Grant Program
     Amount: $15,000
     Status: 2016 – Present (active)
• Whole Blood Gene Expression: Prognostic Value for Seizure Outcome Following Selective Laser Ablation Amygdalohippocampectomy
  Role: Principal Investigator (Weinand)
  Source: Department of Surgery Spring Faculty Seed Grant Program
  Amount: $15,000
  Status: 2016 – 2017 (completed)

• Whole blood RNA Expression Prognostic Factors for Selecting Selective Laser Ablation Amygdalohippocampotomy Candidates
  Role: Principal Investigator (Weinand)
  Source: University of Arizona Health Sciences Clinical Research Pilot Program Award (UAHS-CRPA)
  Amount: $20,000
  Status: 2016 – 2017 (completed)

• Augmented Surgical Microscope for Image Guided Interventions in Brain Tumors
  Role: Co-Investigator (Lemole)
  Source: Barrett Cancer Imaging Grant, University of Arizona
  Amount: $25,000
  Status: 2014 – 2015 (completed)

• Grants from community and charitable organizations also play a crucial role in supporting our academic mission. While the dollar amounts tend to be smaller, these bequests provide essential seed monies for incipient projects. Notable successes include:

  • “Pilot Study: A promising new marker to guide brain cancer treatment” Serum Nagalase Levels and Brain Tumor Burden
    Role: Primary Investigator
    Sponsor: Community Foundation for Southern Arizona
    Amount: $50,000
    Status: 2011 (ongoing)

• Collaborations with industry generate critical capital as well as important partnerships for clinical application of research efforts. In this regard, some of our most prominent efforts include:

  • SMART: A Prospective, Multi-center Registry Assessing the Embolization of Neurovascular Lesions Using the Penumbra SMART COIL System
    Sponsor: Penumbra Inc.
    Role: Principal Investigator – University of Arizona Site (Dumont)
    Amount: $80,000.00
    Status: 2017 – Present (active)

  • RELIEF Study
    Sponsor: Boston Scientific Corp.
    Role: Sub-Investigator (Kasoff)
    Amount: $456,210.94
    Status: 2015 – Present (active)
• A Phase 2b/3, Double-blind, Randomized, Placebo-Controlled, Multicenter Study to Assess the Efficacy and Safety of VX-210 in Subjects With Acute Traumatic Cervical Spinal Cord Injury (VERTEX)
  Sponsor: Vertex Pharmaceuticals Inc.
  Role: Principal Investigator – University of Arizona Site (Dumont)
  Amount: $150,000
  Status: 2014 – 2018 (active)

  Sponsor: InVivo Therapeutics
  Role: Principal Investigator – University of Arizona Site (Dumont)
  Amount: $250,000
  Status: 2014 – 2018 (active)

• National stroke registry to evaluate the safety and effectiveness of a neurothrombectomy device (STRATIS)
  Sponsor: InVivo Therapeutics
  Role: Principal Investigator – University of Arizona Site (Dumont)
  Amount: $50,000
  Status: 2015 – 2017 (completed)

• A Multi-Center, Randomized, Double-Blind, Placebo-Controlled, Parallel-Group Study to Evaluate the Efficacy, Safety and Pharmacokinetics of SUN13837 Injection in Adult Subjects with Acute Spinal Cord Injury
  Sponsor: Asubio Pharmaceuticals
  Role: Principal Investigator (Anton)
  Amount: $391,786.15
  Status: 2013 – 2015 (completed)

• A pilot study to evaluate MR-guided laser ablation of epileptic foci
  Sponsor: Visualase Corporation
  Role: Co-Principal Investigator (Weinand)
  Amount: $49,500
  Status: 2011 – 2014 (completed)

• A Clinical Evaluation of the Eon™ 16-Channel Implantable Pulse Generator (IPG) in Combination with Paddle Leads(s) for the Management of Chronic Back and Neuropathic Leg Pain
  Sponsor: Advanced Neuromodulation Systems Inc.
  Role: Principal Investigator (Weinand)
  Amount: $26,999
  Status: 2006-2012 (completed)

• Federal funding remains the gold standard for support of an academic mission. These grants fund not only primary research but much of the supporting infrastructure in a major academic University. In recent years we have been fortunate to secure high-value Department of Defense (multi-institutional) and NIH awards:
- Development of high-speed and quantitative neuro MRI technologies for challenging patient populations
  Role: Co-Investigator (Kasoff)
  Sponsor: NIH R01 NS102220-01A1
  Amount: $2,143,615
  Status: 2018 – 2023 (active)
- Cerebrospinal Fluid Drainage and Induced Hypertension to Improve Spinal Cord Perfusion in Acute Spinal Cord Injury. Phase 2B Randomized Controlled Trial
  Role: Co-Investigator (PI Local Site - Lemole)
  Sponsor: Department of the Army – USAMRAA
  Amount: $1,653,933.77 ($98,979 Local Site)
  Status: 2015 – 2019 (active)
- High resolution electrical brain mapping by real-time and portable 4D Acoustoelectric Imaging
  Role: Co-Investigator (Weinand)
  Sponsor: NIH-R24
  Amount: $1,170,000
  Status: 2016 – Present (active)
- Dynamic Stabilization of Electro-spinning Process for Production of Inflatable Drug-delivery Stents
  Role: Co-Primary Investigator (Anton)
  Sponsor: National Science Foundation
  Amount: $310,132.00
  Status: 2015 (completed)
- NUE: Engineering Innovation in Biomechanical Nanotechnology
  Role: Co-Primary Investigator (Anton)
  Sponsor: National Science Foundation
  Amount: $199,941.00
  Status: 2014 (completed)
- Blood Brain Barrier Tight Junctions During HIV-1 Dementia
  Role: Co-Investigator (Weinand)
  Sponsor: RO1MH065151, NIH subcontract through Temple University
  Amount: $196,000
  Status: 2005 – 2016 (completed)

- Active IRB studies demonstrate an ongoing commitment to research. The Division of Neurosurgery currently administers or collaborates to maintain a plethora of active clinical studies, both with and without external funding:

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<td>8</td>
<td>A Multi-Center Retrospective Study Comparing Treatment Outcomes between Intracranial Aneurysm Locations and Treatments (COBALT)</td>
<td>UA: 1609879199</td>
<td>Dumont</td>
<td>NA</td>
</tr>
<tr>
<td>9</td>
<td>Vertex (A phase 2b/3, double blind, randomized, placebo controlled, multicenter study to assess the efficacy and safety of VX-210 in subjects with acute traumatic cervical spine cord injury</td>
<td>WIRB: 20152148</td>
<td>Dumont</td>
<td>NA</td>
</tr>
<tr>
<td>10</td>
<td>Humanitarian Device Exemption use of Wingspan Stent System with Gateway PTA Balloon Catheter</td>
<td>BUMCT: 483-18-0016</td>
<td>Dumont</td>
<td>4/16/19</td>
</tr>
<tr>
<td>12</td>
<td>Humanitarian Device Exemption use of Neuroform Microdelivery Stent System</td>
<td>BUMCT: 483-18-0018</td>
<td>Dumont</td>
<td>4/16/19</td>
</tr>
<tr>
<td>13</td>
<td>Humanitarian Device Exemption use of Low Profile Visualized Intraluminal Support Device (LVIS)</td>
<td>BUMCT: 483-18-0017</td>
<td>Dumont</td>
<td>4/16/19</td>
</tr>
<tr>
<td>15</td>
<td>Assessment of a Symptomatic Cerebral Vasospasm Prediction Model</td>
<td>UA: 1602421212</td>
<td>Dumont</td>
<td>NA</td>
</tr>
<tr>
<td>16</td>
<td>DRIPS- Decreasing Rates of Intraurethral Catheterization Postoperatively in Spine Surgery (prostate med after spine surgery)</td>
<td>UA: 1706508628</td>
<td>Dumont</td>
<td>7/11/19</td>
</tr>
<tr>
<td>17</td>
<td>Assessment of complication rates for ventriculoperitoneal shunt performed with and without abdominal access surgeon</td>
<td>UA: 1710888863</td>
<td>Dumont</td>
<td>NA</td>
</tr>
<tr>
<td>18</td>
<td>SMART-A prospective, multicenter registry assessing the embolization of neurovascular lesions using the Penumbra SMART COIL System</td>
<td>WIRB: 1181396</td>
<td>Dumont</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Infratentorial cerebellar AVMs grading system</td>
<td>UA: 1612032429</td>
<td>Dumont</td>
<td>NA</td>
</tr>
<tr>
<td>20</td>
<td>Multicenter, Retrospective Study of the Burden of Mechanical Thrombectomy on Neurointerventional Physicians</td>
<td>UA: 1611986210</td>
<td>Dumont</td>
<td>11/24/17</td>
</tr>
<tr>
<td>21</td>
<td>Retrospective medical chart review of patients undergoing spine surgery to evaluate safety and efficacy</td>
<td>UA: 1809956628</td>
<td>Dumont</td>
<td>9/24/23</td>
</tr>
<tr>
<td>22</td>
<td>Assessing Gait and Balance Using Body Worn Sensors: Does a Successful Clinical Intervention Also Improve Gait and Balance?</td>
<td>UA: 1606625461</td>
<td>Kasoff</td>
<td>6/21/19</td>
</tr>
<tr>
<td>23</td>
<td>Humanitarian Device Exemption use of Deep Brain Stimulation Therapy (DBS) for Dystonia</td>
<td>BUMCT: 483-18-0020</td>
<td>Kasoff</td>
<td>5/18/19</td>
</tr>
<tr>
<td>24</td>
<td>Transcranial Ultrasound for Detection of Deep Brain Stimulation Electrodes</td>
<td>UA: 1808913591</td>
<td>Kasoff</td>
<td>10/16/19</td>
</tr>
<tr>
<td>25</td>
<td>A study of barriers to surgical care for patients with Parkinson's disease in the Tucson Area</td>
<td>UA: 1807778586</td>
<td>Smith</td>
<td>8/19/23</td>
</tr>
<tr>
<td>26</td>
<td>Neuroscience Biorepository (Contains neurosurg samples for future research)</td>
<td>UA: 1507974522</td>
<td>Lemole</td>
<td>5/22/19</td>
</tr>
<tr>
<td>27</td>
<td>Pilot Study: A new marker to guide brain cancer treatment Serum Nagalase levels and brain tumor burden</td>
<td>UA: 1200000960</td>
<td>Lemole</td>
<td>8/16/19</td>
</tr>
</tbody>
</table>
- Some of our emerging research projects deserve specific mention:
  Neurosurgical Genomics (PI: Dr. Weinand)
  Investigating the genetic basis for epilepsy.

Dr. Martin Weinand is a tenured, full professor in the Division of Neurosurgery at the University of Arizona. Dr. Weinand has been clinically active in Tucson for nearly 27 years. He has developed a keen clinical and academic interest in surgical epilepsy care. Most recently, in collaboration with the UA College of Nursing and the UA Functional Genomics Core, he has developed a novel approach using temporal lobe tissue gene expression to predict which patients might benefit most from a temporal lobectomy (Whole genome analysis of resected temporal lobe cortex identifies seizure-free outcome following temporal lobectomy for intractable seizures).

These results have been presented nationally and published. He and his collaborators believe that the research will soon be mature enough to secure federal funding. Dr. Weinand is currently transitioning to a larger degree of employment by our Veterans Administration (VA) Hospital (5/8th) which will make him eligible for federal research funding through the Veterans Administration. This research could have significant application not only for the surgical care of
epilepsy but also have huge implications for the management of epilepsy within the broader context of population health initiatives. The research also dovetails well into the Arizona Health Science Center's strategic initiative for Precision Medicine.

- Robust clinical and translational research programs are an important focus for our neurosurgical research. These efforts have been rewarding and are ongoing in the areas of spine, neurovascular, pain, and tumors and involve multiple departments and colleges within the University.
  - Collaborations with the College of Optical Sciences (Rongguang Liang) have resulted in an R21 submission for the development of a multi-modal endoscope with stereoscopy and navigation for minimally invasive skull base surgery.
  - Partnership with the UA College of Engineering (Marek Romanowski) to develop novel techniques for surgical visualization.
  - Partnership with the UA College of Engineering (Marek Romanowski) to develop innovative devices for cranial nerve monitoring.
  - Multiple projects with the UA Department of Aerospace and Mechanical engineering (Eniko Enikov) focusing on the development of micro flow sensors, electrostatic focusing, surgical spine simulation, soft tissue biomechanics, and the aging spine.
  - Ongoing clinical collaborations exist with the Departments of Medical Imaging and Radiation Oncology within the University of Arizona College of medicine.
  - Dr. Baaj previously initiated a comprehensive spinal outcomes registry. This is being developed by the current spinal neurosurgery section

One of our major academic goals is to achieve national recognition when it comes to our research efforts. NIH (2017) funding of just under $350,000 would place us within the top 40 funded neurosurgical departments in the United States. We will seek to recruit a surgeon scientist who can provide highly focused clinical expertise and successfully compete at the federal level for coveted NIH awards. This sort of recruitment is only possible once neurosurgery has adequate depth and reserve to address all our clinical subspecialty needs as well as our educational imperatives. With full-time faculty positions we are on target for that level of sustainability.

- Future Research goals
  - To encourage scientific inquiry with presentations and presence at local, regional, and national levels.
  - To continue research project design and development momentum to advance them to fully funded trials.
  - Increase the NIH, federal, and industry funding for clinical and translational trials.
  - To establish collaboration and be fully integrated with the new UA Health Sciences Center for Innovation in Brain Science and exploit emerging neuroscience strengths throughout the University of Arizona.
  - To continue multi-disciplinary collaboration across the UofA – an example of a successful collaboration is one with Dr. Romanowski, from the College of Engineering (Biomedical Engineering), working on the project titled, “Realtime Reflex Pupillometry Device for Neurophysiologic Monitoring” funded for $37,588 by Tech Launch Arizona
To recruit a dedicated Surgeon-Scientist to spearhead research efforts in a future Department of Neurosurgery.

Administration

There has been tremendous growth and success within the Division of Neurosurgery over the past 9 years, despite episodes of significant disruption in the Department of Surgery and high turnover throughout Banner and University of Arizona medical leadership. In 2009 the Division had dwindled to 2 FTE neurosurgeons at the University Medical Center. In the intervening years we grew to support 5 FTE neurosurgeons (and are actively recruiting for an additional, approved position) at the main campus. We have been “good citizens” through multispecialty collaborations and institutional service. We have secured strong relationships with our VA affiliate faculty, those at Banner Cardon Children’s Hospital, and neurosurgeons in the Tucson community. We operate a robust subspecialty model that positions us well to compete in local and regional markets. Most importantly, our faculty-specific expertise provides the highest level of care for our patients.

No effort can be sustained without a sound financial plan. A Department of Neurosurgery must work to develop viable revenue streams. Much of this work up to this point has derived from the cultivation of new patient referrals, especially within subspecialty lines. The most successful subspecialties will be those that mature a robust elective practice while maintaining our emergent services as a commitment to our community and educational programs. Over the last 9 years there has been a positive trend with the majority of cases being scheduled electively and derived through outpatient clinic. A strategic business plan must take stock of regional risks and opportunities, and tactics will be developed to actively grow this clinical business. We also encourage revenue through external funding as research efforts mature.

Despite efforts toward fiscal autonomy, we recognize that we must look to the University and BUMC-T for critical resources including faculty remuneration through the Banner University Medical Group Compensation Plan. In neurosurgery, our value to the institution lies predominantly on the Hospital-based inpatient billing/collections in comparison to the physician’s professional fees and billings. The “contribution margin”, acuity adjustments, and related ancillary service billings associated with a successful neurosurgery practice are a huge boon to a hospital and can be fully maximized with adequate physician stewardship. We also understand that the partnership between physicians and hospital organizations is critical to successfully navigate the “new” healthcare reality. When requesting resources from the University or the hospital we will describe not only clinical need but also the financial impact and return on investment for the institution.

All our faculty recognize the importance of service. In recent years, we have been privileged to serve in leadership positions within the hospital, College of medicine, University at large, as well as within our regional and national neurosurgical organizations. This considerable dedication and expertise will be brought to bear on the efforts of a new Department of Neurosurgery at the University Arizona. Notable positions held include:

Hospital (UAMC/BUMC-T)

- Chief-of-Staff: Medical Staff, UAMC/BUMC-T (elected)
- Vice Chair: Hospital Boards, UAMC – Main, UPH, UAMC – South
- Secretary/Treasurer: Medical Executive Committee, BUMC-T (elected)
- Member-at-Large: Medical Executive Committee, UAMC (elected)
- Credentials Committee, UAMC/BUMC-T
• Trauma Peer Review Committee, UAMC/BUMC-T
• Bioethics Committee, BUMC-T
• Quality and Safety Board, UAMC
• Perioperative Services Committee, UAMC
• Value Analysis Program, UAMC
• Bylaws Working Group, UAMC
• Neuroscience Clinical Consensus Group (CCG), Banner Health Network
• Co-director Spine Program, BUMC-T

Department of Surgery
• Neurosurgery Residency Program Director
• Department of Surgery Promotion and Tenure Committee
• Chair Search Committee: Chief, Division of Urology, University of Arizona

University of Arizona
• Codirector, UA Center for Sinonasal and Skull Base Tumors
• UA Strategic Planning and Budget Advisory Committee (elected)
• Institutional Review Board, UA College of Medicine
• Search Committee: Director, UA Center for Innovation in Brain Science
• Search Committee: Chief, UA Neuroradiology Division
• Administrative Review Committee: Chair, Department of Medical Imaging

Regional/National/International
• National Prominence in Tucson Tragedy 2011
• Executive Committee AANS/CNS Joint Section, Disorders Spine & Peripheral Nerves
• Editorial Board, Neurosurgery Portal, Society of Neurological Surgeons
• Section Editor, World Neurosurgery
• President: Western Neurosurgical Society (elected)
• Scientific Program Chair: Western Neurosurgical Society
• Bylaws Committee, Western Neurosurgical Society
• CME Committee, Western Neurosurgical Society
• Chair: Constitution & Bylaws Committee, North American Skull Base Society
• Guest Examiner: American Board of Neurological Surgery
• MOC/CME Committee, American Association of Neurological Surgeons
• Committee-on-Trauma, American College of Surgeons
  o Only 6 neurosurgeons on national committee
  o Only neurosurgeon on National Trauma Databank
• Neurosurgery Liaison, American College of Surgeons (ACS) Level I Trauma Program
• Congress of Neurological Surgeons Annual Meeting Scientific Committee
• Executive Committee, Arizona Neurosurgical Society
• Brain Injury Association of Arizona Advisory Council
C. Describe demonstrable partnerships and partnership support that arise from the creation of the unit.

Neurosurgery has a long history of synergistic collaboration within the college of medicine as well as the University at large. These relationships span our clinical, educational, and academic/research missions.

Clinical
- Partnered to establish Neurological Intensive Care Unit (2016)
- Working to secure Comprehensive Stroke Center certification (target 2019)
- Cultivated community and VA neurosurgery relationships & faculty appointments
- New multidisciplinary clinical efforts (many tertiary services did not exist previously):
  o Center for Sinonasal and Skull Base Tumors (2010)
    - (neurosurgery/otolaryngology/neuroradiology/radiation oncology/endocrinology/ophthalmology)
  o Neurovascular Program (2013)
    - (neurosurgery/neurology/neuroradiology)
  o Neurosurgical Spine Service (formalized 2013)
    - (neurosurgery/neurology/neuroradiology)
  o Neuromodulation Program (2014)
    - (neurosurgery/neurology/neuroradiology)
    - First interventional MRI-guided deep brain stimulation procedure and iMRI program in Arizona

Educational
- Expanded relationship with Cardon Children’s Hospital affiliates
  - Resident rotation for 6 months
- Multidisciplinary conference educational programs
  - Neuro-oncology Tumor Board
  - Epilepsy Conference
  - Complex Spine Conference (since AY 2014)
  - Neurovascular Conference (since AY2014)
  - Neuromodulation Conference (since AY2016)
  - Movement Disorders Conference (since AY2016)
- Successful development of a Surgical Neuroanatomy Laboratory
  - Shared with Otolaryngology, Head & Neck Surgery
- Establishment of Neuroscience Biorepository with the Arizona Bio-signatures Laboratory

Research
- College of Medicine partnerships
  - Medical Imaging, Radiation Oncology, UA Functional Genomics Core, UA Cancer Center
• University Collaborations
  o UA Colleges of Optical Sciences, Nursing, Engineering, Aerospace and Mechanical engineering
• Extramural Academic Affiliations
  o Barrow Neurologic Institute, Temple University, UCLA

We would expect these relationships to grow in breadth and depth with the transition to departmental status. We already have a long list of collaborators who would wish to pursue affiliate appointments in a new Department of Neurosurgery:

Potential Affiliate Faculty: UA College of Medicine and

a. Jennifer Becker, M.D.
   i. Assistant Professor of Medical Imaging (UA)

b. Maria Bishop, M.D.
   i. Associate Professor of Medicine (UA)

c. Eugene Chang, M.D.
   i. Associate Professor of Otolaryngology, Head & Neck Surgery (UA)
   ii. Vice Chair Otolaryngology, Head & Neck Surgery, University of Arizona

d. Kristian Doyle, PhD
   i. Assistant Professor (research) of Immunobiology (UA)
   ii. Assistant Professor (research) of Neurology (UA)

e. Mohammad El-Ghanem, M.B.B.S.
   i. Assistant Professor of Neurology (UA)

f. Gloria Guzman, M.D.
   i. Assistant Professor of Medical Imaging (UA)

g. Michael Hammer, Ph.D.
   i. Professor (research) of Neurology (UA)

h. Mohab Ibrahim, M.D., Ph.D.
   i. Associate Professor of Anesthesiology (UA) - Clinical Scholar Track
   ii. Associate Professor of Pharmacology (UA) - Clinical Scholar Track

i. Bellal Joseph, M.D.
   i. Professor of Surgery (UA)
   ii. Chief, Division of Trauma Surgery, University of Arizona

j. Wayne Kubal, M.D.
   i. Professor of Medical Imaging (UA)

k. David Labiner, M.D.
   i. Professor of Neurology (UA)
   ii. Chair, Department of Neurology, University of Arizona

l. Christopher Le, M.D.
   i. Assistant Professor of Otolaryngology, Head & Neck Surgery (UA)

m. Amol Patwardhan, M.D., Ph.D.
   i. Assistant Professor of Anesthesiology (UA)
   ii. Assistant Professor of Pharmacology (UA)

n. Marek Romanowski, Ph.D.
   i. Associate Professor (research) of Biomedical Engineering (UA)
How does formal creation of this unit directly promote the fostering of collaborative and synergistic research and outreach beyond what is already happening on campus with existing entities?

Clearly, Neurosurgery has accomplished a great deal over the last decade despite its divisional status. There is no doubt that this has limited our growth in other areas. Specifically, the lack of parity with other departments such as neurology and orthopedic surgery have made it difficult to establish and codify meaningful relationships. Should the University and Banner ever wished to transition to a Neuroscience Institute model, departmental parity will be critical as neurosurgery remains one of the key movers of any neuroscience effort. Departmental status also allows neurosurgery to have a “seat at the table” with regard to regular but important strategic meetings and decisions (e.g. monthly chair meetings, medical executive committee, strategic planning groups). I relate the fact that neurosurgery was conspicuously absent from the “white paper” group which initiated the creation of the University of Arizona Center for Innovation in Brain Science. This was not a deliberate omission, rather a reflection of the fact that no one thought to look below the departmental level as the list of key collaborators and stakeholders was compiled. Ultimately, departmental status will favorably position us within the College of Medicine and the University at large and align us with the vast majority of academic neurosurgery groups throughout the nation.

E. Alignment of the proposed unit’s purpose to the reporting unit and the University’s strategic goals.

The following strategies are very much dependent upon the ability of an independent Department of Neurosurgery to work closely with the Hospital, the College of Medicine, and other departments to grow the neurosurgical “book of business” and increase market share along with positive returns. Understanding that the operating rooms are the “engine” that drives the hospital’s margin, this growth will be predicated upon shoring up current programs/obligations (retention) and developing or augmenting new lines of business (recruitment). Departmental status will also allow
neurosurgery a seat at the table with respective Hospital and College of Medicine strategic partners to develop these business strategies in a cohesive fashion.

- Increase market share/cases
  - Spinal surgery (currently, last out of 4 major groups in town)
    - Fix relationship with orthopedic surgery
    - Ally with best community spinal surgeons (University affiliations, OR resources to entice them to bring cases, ultimately employment)
  - General Neurosurgery
    - We compete well (trauma, basic cranial/spine)
    - Ally with best community neurosurgeons (University affiliations, OR resources to entice them to bring cases, ultimately employment)
  - Skull base surgery
    - We control the Tucson market – grow by drawing from Phoenix where Banner does not have our capabilities
  - Neuro-Oncology
    - We dominate the Tucson market but need better synergies with our own AZ Cancer Center to compete with the likes of US/AZ Oncology
  - Functional/neuromodulation (movement disorder) surgery
    - We are competitive in the Tucson market
      - Poised to absorb largest practice with competitor retirements
      - Grow by drawing from Phoenix where Banner more limited
  - Epilepsy surgery
    - We control the Tucson market, likely saturated
  - Pediatric neurosurgery
    - Real need in Tucson if Banner can resource
      - Will lose money on Neurosurgeon, gain on margin and ancillaries
      - Can coordinate with Banner Cardon Children’s Hospital

- Grow elective book of business
  - Bottleneck for employed and community surgeons is OR time
    - Should be rectified with new OR’s and availability
  - Strategies to improve clinic efficiencies
    - Surgeons seeing more patients that actually need surgery
    - Offload nonsurgical patients to multispecialty affiliates
      - Neuroscience Institute is the best model for this
    - More advance practice practitioners (NPs, PAs) to redirect patients

- Maximize current business efficiency
  - Shorten LOS (utilize APPs, residents, hospitalists, multispecialty affiliates)
  - Supply chain standardization/optimization (build consensus to restrict products)
    - Engage doctors to negotiate with vendors
  - Minimize complications/cost of complications
    - Establish care standards and pathways
    - Departmental quality review
These sweeping changes can only be affected at the Department level by clinicians and leaders with direct and intimate working neuroscience knowledge. A Department of Neurosurgery will be able to partner and lead in a way that a division never could.

F. Documented support from affiliated faculty, department heads, and deans. At the college level, alignment of the proposed unit's goals and objectives to the college's recruitment plan and programmatic priorities.

We have been building consensus within the Division of Neurosurgery and Department of Surgery as a whole over the last few years. This is consisted of direct discussions with faculty members as well as presentations at group meetings/rounds. Most recently, attempts were made to contact all of the College of Medicine – Tucson chairs to inform them of our efforts to become a department and address any queries or concerns. All but three chairs were successfully contacted in person or via phone conversation. All of these expressed their support for the creation of a Department of Neurosurgery within the College of Medicine – Tucson (see supplement COM Chairs 2018.docx). We have the full support of the Department of Surgery chair, Dr. Leigh Neumayer, who is graciously provided us with “startup” financial support from her own chairs package. We have also been working with the Dean and with the various branches of Banner Healthcare to develop specific goals and objectives for alignment with the College of Medicine and Hospital. These are listed above in section “E”.

G. Clear statement of the evaluative criteria to be used in the comprehensive review. How will the proposed unit demonstrate success?

360° evaluation of the program will be done on an annual basis. Metrics to be evaluated include scholarly activity of the faculty, NIH and non-NIH research funding, clinical volume and faculty productivity as reflected by net collections and RVU metrics, residency and medical student teaching evaluations and both in-service (SANS) and Board pass rates for current and graduating residents. AAMC faculty forward survey will also be used as a tool to gauge effectiveness of chair and faculty sentiment towards mentoring, academic production and job satisfaction. Specific metrics of success will be dependent upon the particular program being developed (e.g. Spine, stroke, neuro-oncology) and will be determined in conjunction with the College of Medicine, Hospital, and collaborative departments/groups. Examples of such SMART goals could include:

- Clinical
  - Improve access to care
    - Improved clinic access by existing measures
    - Timeline: 1 year
  - Improve OR/hospital throughput
    - Better resource allocation and efficiencies
    - Timeline: 1 year
  - Work to create an improved, institute-based patient experience
    - Timeline: 3-5 years
  - Further recruitment/retention of high-quality, subspecialty faculty
    - Goal of 7-8 FTE neurosurgeons in the department
• Expand to fully cover pediatric neurosurgery
  • “bench depth” to complex spinal surgery, surgical neuro-oncology
  • Timeline: 3-5 years
    o Repair spine program
      • Outreach to orthopedic surgery
      • Internal Neurosurgery growth
      • Timeline: 1 year
  • Educational
    o Apply for resident compliment increase (from 1/year to 1.5/year) in January 2020
      • Timeline: Implementation by Neurosurgical match 2021
    o Obtain CAST-approval for multi-institutional spine fellowship (UA/BNI)
      • Timeline: 3 years
  • Academic
    o Secure surgeon-scientist FTE
      • Timeline: 3-5 years
    o Increase external funding with emphasis on federal and sustainable sources
      • Timeline: 3 years
  • Administrative/financial
    o Maintain a positive budget for operations
      • Transition to group-plan for neurosurgery
      • Timeline: in process
    o Work to develop synergies in the neurosciences within UA/Banner
      • Institute model
      • Timeline: 3-5 years

III. Resources

A. Faculty and Staff

1. Provide the name and employee ID of the unit head.

G. Michael Lemole, Jr., M.D. (UA Employee #17806693)

2. List the name, rank, highest degree, primary department and estimate of the level of involvement of all current faculty and professional staff who will participate in the new unit. Also, indicate the position each person will hold in the new unit.

Core Faculty: Banner University Medical Center – Tucson

a. Travis Dumont, M.D., ABNS Board Certified
   i. Associate Professor of Neurosurgery (UA), tenure-eligible
   ii. Associate Professor of Medical Imaging (UA) - adjunct
   iii. Program Director, Neurosurgery Residency, University of Arizona
   iv. Director, University of Arizona Neurovascular Program
b. **John Hurlbert, M.D., Ph.D.**, ABNS Board Certified
   i. Professor of Neurosurgery (UA), tenure-eligible
   ii. Vice-chair, Department of Neurosurgery, University of Arizona
   iii. Director, University of Arizona Neurosurgery Spine Program

   c. **Willard Kasoff, M.D.**, ABNS Board Certified
      i. Assistant Professor of Neurosurgery (UA), tenure-eligible
      ii. Assistant Professor of Neurology (UA) - adjunct
      iii. Director, University of Arizona Neuromodulation Program

   d. **G. Michael Lemole, Jr., M.D.**, ABNS Board Certified
      i. Professor of Neurosurgery (UA), tenured
      ii. Professor of Otolaryngology, Head & Neck Surgery (UA) - adjunct
      iii. Chair, Department of Neurosurgery, University of Arizona
      iv. Codirector, UA Center for Sinonasal and Skull Base Tumors

   e. **Martin Weinand, M.D.**, ABNS Board Certified
      i. Professor of Neurosurgery (UA), tenured
      ii. Vice-chair, Department of Neurosurgery, University of Arizona

**Non-clinical Active Faculty: University of Arizona**

a. **Allan Hamilton M.D.**, ABNS Board Certified
   i. Regents Professor of Neurosurgery (UA), tenured
   ii. Executive Director, Arizona Surgical Technology & Education Center (ASTEC), UA College of Medicine (Funded through COM and ASTEC)

**Staff: Banner University Medical Center – Tucson**

a. **Randall Blute, FNP-C, MSN, CFRN**
   i. Advanced Practice Provider (Banner)

b. **Veronica Camacho**
   i. Administrative Assistant (Banner)

c. **Sara Perotti, ACNP**
   i. Advanced Practice Provider (Banner)

d. **Julie Schippers**
   i. Manager, Residency Program (UA)

e. **Christina Walter, MS**
   i. Research Coordinator (UA)

**Integrated Faculty: S. AZ Veterans Administration Health Sciences Center (SAVAHC)**

a. **Rein Anton, M.D., Ph.D.**, ABNS Board Certified
   i. Clinical Assistant Professor of Neurosurgery (UA) – Clinical Scholar Track
   ii. Staff Neurosurgeon (SAVAHC)

b. **Bryan Pereira, M.D.**, ABNS Board Certified
   i. Academic Appointment at University of Arizona (UA) - in process
   ii. Chief, Division of Neurosurgery (SAVAHC)

b. **Scott West, D.O.**, American Osteopathic Board of Surgery Certified
   i. Academic Appointment at University of Arizona (UA) - in process
   ii. Staff Neurosurgeon (SAVAHC)
Pediatric Neurosurgery Faculty: Cardon Children’s Hospital

a. **David Moss, M.D.**, ABNS Board Certified, ABNS (Pediatrics) Certified
   i. Clinical Associate Professor of Neurosurgery (UA) – Clinical Series Track
   ii. Chief of Surgery (Cardon Children’s Hospital)

b. **Ashley Tian, M.D.**, ABNS Board Certified, ABNS (Pediatrics) Certified
   i. Academic Appointment at University of Arizona (UA) - *in process*
   ii. Staff Pediatric Neurosurgeon (Cardon Children’s Hospital)

Community Associated Faculty: Regional Hospitals

a. **Richard Chua, M.D.**, ABNS Board Certified
   i. Academic Appointment at University of Arizona (UA) - *in process*
   ii. Staff Neurosurgeon (Northwest Medical Center)

b. **Marco Marsella, M.D.**
   i. Clinical Assistant Professor of Neurosurgery (UA) – Clinical Scholar Track
   ii. Staff Neurosurgeon

c. **Sergio Rivero, M.D.**, ABNS Board Certified
   i. Clinical Assistant Professor of Neurosurgery (UA) – Clinical Series Track
   ii. Staff Neurosurgeon (Tucson Medical Center)

d. **Thomas B. Scully, M.D.**, ABNS Board Certified
   i. Clinical Associate Professor of Neurosurgery (UA) – Clinical Series Track
   ii. Staff Neurosurgeon (Northwest Medical Center)

Non-Clinical Adjunct Faculty

a. **John B. Oldershaw, M.D., J.D.**, ABNS Board Certified
   i. Clinical Associate Professor of Neurosurgery (UA)
   ii. Retired

Former Faculty (over past 10 years)

a. **Ali Baaj, M.D.**
   i. Assistant Professor of Surgery (UA) – Former Title
   ii. Assistant Professor of Neurological Surgery (Weil Cornell Medical College)

b. **Jack Dunn, M.D.**, ABNS Board Certified
   i. Clinical Assistant Professor of Surgery (UA) – Former Title
   ii. Chief, Division of Neurosurgery (SAVAHC) – Former Title
   iii. Recently Retired

c. **Sebastian Herrera, M.D.**
   i. Adjunct Faculty (SAVAHC) – Former Title
   ii. Staff Neurosurgeon (SAVAHC) – Former Title
   iii. Clinical Assistant Professor (University of Texas Health Medical School)

d. **Jean-Philippe Langevin, M.D.**
   i. Clinical Assistant Professor of Surgery (UA) – Former Title
   ii. Staff Neurosurgeon (SAVAHC) – Former Title
   iii. Assistant Professor-in-Residence of Neurosurgery (UCLA)
   iv. Director Stereotactic & Functional Neurosurgery Fellowship (UCLA)

e. **Sergio Rivero, M.D.**, ABNS Board Certified
3. List the clerical and support staff positions that will be included in the new unit.

**Administration**

a. Administrative Associate/assistant (Banner)
   i. May require additional support personal as Department expands
   ii. May include UA student hire – part time
b. Residency Program Coordinator/Manager (UA or Banner)
c. Business manager – shared or outsourced (Banner)
d. Analyst (UA) – shared or outsourced (Banner)
e. Research coordinator (UA)

**Residency**

a. One resident/year for a total of 7 residents
b. Starting in 2020, application to increase the resident complement
   i. 1.5 residents/year for a total of 10-11 residents by Fall 2020
   ii. 2 residents/year for a total of 14 residents by 2025
   iii. Will seek additional GME funding sources (VA, Cardon Hospitals)
c. We intend to initiate a clinical spine fellowship program as early as FY2018
   i. With fellows hired as clinical instructors
d. We are also considering a multidisciplinary critical care fellowship in the near future
   (in collaboration with Neurology and Neuroanesthesia)

4. Project the number and type of new faculty and staff positions that will be needed by the unit during each of the next three years.

a. Neurosurgeon (General/Complex Spine) to fill current vacancy
   i. Plan to replace in the coming year (FY2019) – currently approved
   ii. See existing pro forma *(Replace NS BCAP 21333)*
b. Pediatric Neurosurgery recruitment – 1.0 FTE
   i. Plan to add in the next three years when hospital resources secured
   ii. pro forma to be produced as recruitment opportunities arise, with significant institutional financial support to offset any losses.
   iii. Could be coordinated with Banner Cardon Children’s Hospital to share resources and coverage responsibilities
c. Surgeon-scientist recruitment – 1.0 FTE
   i. Plan to add in the next three years with significant external funding
   ii. pro forma to be produced as recruitment opportunities arise.
d. Clinical Spine Fellow – 1.0 FTE
   i. Filled with enfolded (resident) fellow in FY2018
   ii. Will hire as clinical instructor with future fellows in 2019
   iii. Working to secure unrestricted educational funding through industry grants
e. UPH-based Advanced Practice Providers, clinic-based – 3.0 FTE
   i. Plan to add inpatient APP in the coming year (FY2019) – currently approved
   ii. Additional practitioners (outpatient) to be added to support remaining neurosurgery service lines (cranial, functional) over the next year.
   iii. See existing pro forma (Replace APP BCAP 26679)
f. Academic research coordinator.
   i. Administer IRB/grant submissions and database maintenance
   ii. Maintain and grow current divisional research coordinator to full-time
   iii. Future emphasis on resourcing position through external funding and grants.
   iv. Anticipate 3 years support for $200,000, (DOS Support package)
g. Additional administrative associate/assistant (Banner)
h. Analyst (can be shared with another department – e.g. DOS)
i. Business Administrator (can be shared with another department – e.g. DOS)

B. Physical Facilities and Equipment

1. Provide the Unit address for the new department. Include the following:

   a. Building name: AHSC
   b. Building number: 201
   c. Room number: 4303
   d. Post office box number: 245070
   e. Zip code: 85724
   f. Phone number: 520-626-5003

2. Identify the physical facilities that will be required for the new unit and indicate whether those facilities are currently available.

   a. Neurosurgery Department Office
      i. Neurosurgery faculty members and staff are currently located on the 4th floor office suites in the Department of Surgery. This space might be reasonably appropriated from the Department of Surgery. Our current office space can comfortably accommodate up to eight neurosurgical faculty and support staff. Our VA affiliates will remain at that facility. Future strategic planning may necessitate moving the neurosurgery offices to allow greater proximity with other neuroscience and affiliated services. Much of this will be dependent on the allocation of converted office space the University of Arizona controls in the former PC clinic building.

   b. Neurosurgery Department Conference Room/Library
      (Needed to facilitate department meetings, lectures and conferences.)
      i. Currently, we share a resident library within the Department of Surgery. This facility is inadequate for department meetings, lectures, and conferences. We currently conduct those activities in scheduled space within the College of Medicine. In the future, a defined space for the Department of Neurosurgery would be ideal. It would be reasonable however, to share such a facility with another collaborative department such as otolaryngology or neurology.
c. Expanded Neurosurgical Anatomy Laboratory
   i. A neurosurgical anatomy laboratory allows us to perform critical educational activities as well as conduct certain types of anatomical or in vivo research.
   ii. Our current facility is adequate for our immediate needs but would need significant expansion for more effective utilization including regional and national educational course offerings. *It would be reasonable to develop such a facility in conjunction with collaborative surgical departments including otolaryngology, as well as University-wide programs such as ASTEC.*

d. Neurosurgery Clinic (In the North Campus Clinic with Otolaryngology.)
   i. This space is adequate for our current utilization.
   ii. Future consideration should be given to the development of multidisciplinary clinics occupying a common space. Under this paradigm neurosurgery, neurology, and other affiliate services such as otolaryngology would coordinate clinic activities in space to comprehensively serve patients with unified disease processes. This opportunity may arise in the new clinic building or in future iterations as office space/ambulatory center facilities are added. It will be important to make sure that adequate resources for coverage of an offsite clinic and hospital/OR/ED responsibilities are secured so that service interruptions are avoided.

3. List all additional equipment that will be needed during the next five years and the estimated cost.
   a. No major technology needs (OR and clinic equipment costs are hospital-based) and current office and laboratory resources are adequate.

C. Library Resources, Materials, and Supplies

1. Identify any additional library acquisitions that will be needed during the next three years and the estimated cost.
   a. No additional library resources are expected

2. List any special materials or supplies, other than normal office supplies, that will be required by the new unit.
   a. Business copying machine - *existing*
   b. Fax machine - *existing*
   c. Computers for all faculty and staff – *existing*
   d. Ongoing maintenance and replacement of IT assets (UA or Banner) would be allocated to BUMG as currently under the Department of Surgery
D. Other Information

1. Identify any implications of the proposed change for regional or programmatic accreditation.

a. There are no implications for accreditation. The formation of the Neurosurgery Department will better position the program on the national stage, improve our ability to recruit and retain faculty and residents and allow it to have a stronger voice in the College of Medicine and Banner Health Network. This will be especially important as the University of Arizona and Banner Health Network collaborate to provide in-network subspeciality neurosurgery care to the broader Southwestern region. Granting neurosurgery departmental status will allow us to offer our considerable tactical experience on a broader playing field.

2. Provide any relevant information, not requested above, that will assist reviewers in evaluating this proposed addition.

a. Please see attached SUPPLEMENTS including:
   i. Neurosurgery Accomplishments Executive Summary 2009-2018
   ii. Neurosurgery Vision Statement 2018
   iii. Recent University of Arizona Department of Surgery Academic Program Review (APR) – Division of Neurosurgery section, 2017
   iv. University of Arizona/Banner Neuroscience Institute - A White Paper, 2018

b. Additional SUPPORT documentation is also listed:
   i. Department of Neurosurgery SMART Goals
   ii. College of Medicine Chair Support Documentation
   iii. Department of Neurosurgery – Potential Concerns
   iv. “Qualitative” Budget Assessment

E. Financing

1. Explain the university's plan for providing adequate financing for the unit.

a. Please see proposed Division of Neurosurgery budget for the current year (NEURO ABOB New Org Budget 2019) as well as the pro forma for new faculty and APP hires (Replace NS BCAP 21333, Replace APP BCAP 26679). These projections demonstrate adequate funding from clinical revenue (wRVU model from practice plan), institutional mission support, state funds, startup funds (from DOS), and discretionary funds to sustain current operations. **Dr. Neumayer has generously offered a startup fund ($500,000) from her own recruitment/retention package, for the new Department of Neurosurgery. This has been in use since 2017 to support research operations.** It will be important that our compensation model remains competitive with national academic practices to recruit and retain the best faculty, residents, and staff, and that will require ongoing discussions with the University of Arizona College of Medicine and Banner University Medical Center - Tucson.
2. Identify potential sources for external funding for the unit.

a. The primary external funding for the Department of Neurosurgery will be clinical revenue (Banner wRVU compensation plan with discretionary spending). Other external sources include revenue from Banner University Medical Center (Tucson) mission support (e.g. trauma call, stroke call monies), Startup funding from the Department of Surgery, grants, and industry sponsored educational grants. Future plans for regional, educational neuroscience conferences with industry support will provide additional income. Philanthropy and direct outreach will be greatly facilitated by departmental status. Additionally, the Division of Neurosurgery will continue its practice of “taxing” call monies to resource funding for academic and educational discretionary spending.

3. If state funds will be used, indicate whether new appropriations will be requested or existing appropriations will be reallocated. If reallocating existing appropriations, indicate where these will be drawn from.

a. The proposal includes a possible reallocation carved-out of existing Department of Surgery state appropriations including GME (through BUMC-T) support subject to College of Medicine approval; this allocation should be based on dollars per current faculty/resident complement as appropriate.

4. Complete the Budget Projection Form, projecting the operating budget for the proposed unit for the next three years.

a. The proposal includes a possible reallocation carved-out of existing Department of Surgery state appropriations including GME (through BUMC-T) support subject to College of Medicine approval; this allocation should be based on dollars per current faculty/resident complement as appropriate.

5. Estimate the amount of external funds that may be received by the unit during each of the first three years.

*Please reference the ABOR budget 2019 (see attached)

a. Future revenue sources to include:
   i. Grants based on successful submission for federal funding
   ii. Future CME course registration revenue
   iii. Philanthropic fundraising

b. Notable Sources of Income (some listed above)
   i. Special start-up funding from Department of Surgery, $500,000/2 years
   ii. AHSC/COM start-up funding Chair support (usually 0.25 FTE)
   iii. BUMC-T Chair support (usually 0.25 FTE)
   iv. Internal Tax on call monies (~5% on all call monies before individual payout)
6. Provide the unit account number (if previously assigned).

Not Applicable
IV. **Additional Information** — provide any other information not requested above that may be useful in evaluating this proposal.

V. **Required Signatures**

Managing Unit Administrator: G. Michael Lendle Jr., Chief Neurosurgery  
(name and title)

Managing Administrator’s Signature: ___________________________ Date: 2/28/17

Dean’s Signature: ___________________________ Date: 2/21/19

All programs that will be offered through distance learning must include the following signature. The signature of approval does not indicate a commitment to invest in this program. Any potential investment agreement is a separate process.

Joel Hauff, Associate Vice President of Student Affairs & Enrollment Management/Academic Initiatives and Student Success

Signature: ___________________________ Date: ___________
November 1, 2018

This submission has the full consent and approval of the Division of Neurosurgery.

G. Michael Lemole, Jr., M.D., Professor of Surgery

Martin Weinand, M.D., Professor of Surgery

Travis Dumont, M.D., Associate Professor of Surgery

Willard Kasoff, M.D., Assistant Professor of Surgery

John Hulbert, M.D., Ph.D., Professor of Surgery

Allan Hamilton, M.D., Regents Professor of Surgery
September 6, 2018

Irving Kron, M.D.
Interim Executive Dean, College of Medicine – Tucson
Senior Associate Vice President, UA Health Sciences
Professor, Department of Surgery
University of Arizona
Arizona Health Sciences Center, Rm 2205
Tucson, AZ 85724

Dear Dean Kron,

It is my distinct pleasure to provide this letter in support of the ongoing efforts to transition the Division of Neurosurgery at the University of Arizona to a departmental status. I will frame this letter of support within the context of two main ingredients necessary for academic success, namely the selection of the leadership and the structure under which they can operate.

It is undeniable that you have a gem in the person of Dr. Michael G. Lemole leading the Division of Neurosurgery. I, as well as many in the neurosurgical community at large, am quite familiar with his remarkable achievements. He has grown neurosurgery at the University of Arizona from a relatively small program to one that has a regional and national recognition. He has attracted and retained superb faculty. He has doubled the clinical volumes. His academic output has been tremendous with more than 120 peer reviewed manuscripts over the last 6 years or so and secured significant extramural funding- exceeding 3.5 million dollars. As a result, neurosurgery at the University of Arizona is well primed to continue to lead and be a key asset in the growth of the neurosciences, an area which remains well poised for expansion both in Arizona and nationally.

As I am sure you are aware, a departmental structure allows for much greater ability to sustain the tripartite objectives of teaching, research, and delivery of clinical care. Achieving departmental status is a benchmark by which a program is viewed at the national level. It is also a yardstick by which resident applicants and faculty recruits measure the program as well as the parent institution’s commitment to its preeminence. A divisional status for neurosurgery is nowadays an anachronism. In sum, there is no doubt that the transition to a department will yield tremendous benefits to the medical school and the institution.
You have much to be proud as you consider the achievements of neurosurgery under the leadership of Dr. Lemole. I wish your institution and him continued success and hope that the growth of neurosurgery from a division into a department will occur soon. You can be assured that reaching the department milestone for Neurosurgery at the University of Arizona will be met with cheers and support from academic neurosurgery throughout the country.

Congratulations once again to all of you for all this progress.

With best regards, sincerely.

Fady T. Charbel, MD
Professor and Head
Department of Neurosurgery
Richard L. & Gertrude W. Fruin Professor
University of Illinois at Chicago
Dear Dr. Kron,

I am writing this letter to express my strong support for the UA Neurosurgery application for departmental status. Having taken the UA Otolaryngology program to department status in 2014, I feel that I am very familiar with the process and the expectations that come with being a clinical department at the University of Arizona.

Since the recruitment of Michael Lemole in 2009, the neurosurgery program has been revitalized. Long a clinical only program, the program has expanded in its clinical activities, research production and educational programs. The program has expanded its faculty and clinical reputation, with an ability to draw patients from across the Southwest. They have stabilized their residency program and now have a very competitive program that draws talented medical students from across the country. They have increased their research production, from clinical research to translational research with collaborations with other departments across the campus.

Much like Otolaryngology, the ability of a neurosurgery program to compete for the best faculty and residents is linked to its ability to be an autonomous program. Nearly all the neurosurgery programs in the country are their own separate departments and to be a division of surgery presents a major challenge to recruiting efforts and funding applications. I truly believe that becoming its own department will allow the neurosurgery program to expand its clinical and academic reputation beyond the southwest and to the national stage.

I wish you the best of luck in your new position. The success of an institution is dependent on having the right leaders with the humility and will to make a difference. Making Neurosurgery a department will give Michael Lemole, who I regard as one of the best and brightest Tucson has to offer, a “seat at the table” to help in this transition.

Sincerely,

[Signature]

Alexander Chiu, M.D.
Russell E. Bridwell, M.D. Chairman and Professor
Department of Otorhinolaryngology-HNS
University of Kansas School of Medicine
Kansas City, KS

September 6, 2018

Irvine Kron, MD
Interim Executive Dean, College of Medicine-Tucson
Senior Associate VP, UA Health Sciences
University of Arizona
September 9, 2018

Irving Kron, MD
Executive Dean, College of Medicine
The University of Arizona
1501 North Campbell Avenue
Tucson, Arizona 85724

Dear Dean Kron,

I am writing this letter to support the elevation of the Section of Neurosurgery, Department of Surgery to be its own, freestanding department. If judged on the typical academic criteria, clinical service, research, service and teaching, they certainly warrant serious consideration for this transition to departmental status.

Considering these individual areas, the clinical services provided by the section of neurosurgery are provided by a diversely trained group of clinicians who cover the gamut of neurosurgical areas. In fact, the entire neurosurgery faculty is fellowship trained in their primary area of interest and responsibility. Because of the addition of faculty and the development of residency training, the surgical volume has doubled in the past decade. They of course are an integral part of the level 1 trauma program and the future neuroscience service line.

Although they carry a heavy clinical load, the neurosurgery faculty has been academically productive. They have received extramural funding and have published over 100 peer-reviewed manuscripts in the past few years.

Educationally, they have a fully accredited residency program that trains 7 residents. Additionally they provide surgical electives for medical students and neurology residents.

Finally, in the service realm, neurosurgery faculty has served on hospital, college and university committees often in leadership roles.

In summary, I believe that the Section of Neurosurgery has demonstrated across the breadth of academic criteria that they are worthy of elevation to Departmental status. I support their request fully and without reservation.

Yours truly,

David M. Labiner, MD
Professor and Head
September 10, 2018

Irving Kron, M.D.
Interim Executive Dean, College of Medicine – Tucson
Senior Associate Vice President, UA Health Sciences
Professor, Department of Surgery
University of Arizona
Arizona Health Sciences Center, Rm 2205
Tucson, AZ 85724

Re: Neurosurgery Application for Department Status

Dear Dr. Kron,

Please allow me to lend my endorsement to the application underway at your University for Neurosurgery Departmental status. Under the leadership of Dr. Michael Lemole the current Division has enjoyed tremendous growth and success, earning its well-deserved reputation as an academic presence in North American Neurosurgery circles. Having trained 20 years ago in Phoenix, I personally recognize this transformation is long overdue; it has been welcomed both locally and nationally. The documentation you have in front of you provides testimony that I won’t reiterate here. Dr. Lemole deserves full credit.

I know you are well aware that an important next-step towards a mature academic portfolio is to gain recognition as a Department. In my opinion your Neurosurgery Division has reached that inflection point, ready to make the transition or otherwise remain constrained from reaching its full academic potential. Looking nationally, more than 95% of neurosurgical academic programs function as departments not divisions.

Thank-you for allowing me the opportunity of articulating my opinion. I’d be happy to speak with you personally at your convenience if you have any questions or concerns.

Sincerely Yours,

Allan D. Levi, M.D., Ph.D., F.A.C.S.
Professor and Chairman
Department of Neurological Surgery
University of Miami MILLER School of Medicine
Chief of Neurosurgery
Jackson Memorial Hospital
Robert M. Buck Distinguished Chair
in Neurological Surgery
October 24, 2018

Dean Irving Kron, MD  
Interim Dean, College of Medicine – Tucson  
Senior Associate Vice President, UA Health Sciences  
Professor, Department of Surgery

Dear Dean Kron,

I would like to offer my support for neurosurgery in their effort to achieve department status within the College of Medicine at the University of Arizona. I have worked closely with the division of neurosurgery for my entire career at the University of Arizona. I am the current chair of radiation oncology, and in such a capacity, work with the current neurosurgery team on a regular and intimate basis.

Over the last decade, I have noted tremendous growth within the division of neurosurgery. They have expanded to embrace a subspecialty model that integrates well with our multidisciplinary program to deliver the right care to the right patient at the right time. As such, they become a resource for the entire Southwestern neuroscience community. In particular, there has been tremendous growth in the number of brain and skull base tumors treated, and accordingly, a significant number of these require the services of radiation oncology. I have been able to personally witness the outstanding care rendered to these patients at all phases of their medical journey.

This kind of working relationship would not be possible without true collegial respect between specialists. In my experience, the neurosurgeons have always exerted the sort of humility which places the patient's needs first. On a regular basis, they will defer complex surgical procedures if the patient is better served by a radiotherapy paradigm. The neurosurgery team has also shown real enthusiasm engaging us on an academic level, whether that involves education or research and publication. These sorts of outstanding interactions are what academic medicine is all about! My understanding is that they have forged similar relationships with other departments such as neurology, otolaryngology, and medical imaging.

The health of any institutional neuroscience effort will necessarily depend upon the strength of its neurosurgery group. I have personally seen my own ability to treat neuroscience patients rise and fall with the fortunes of neurosurgery. I believe that granting departmental status will bring a new level of sustainability to neurosurgery at the University of Arizona. This decision will bring them to the table for many strategic decisions, allow them to recruit and retain the brightest and best, and extend their influence throughout the entire system. Most importantly, it will permit them to continue to offer the highest level of clinical care, provide outstanding education, and advance our academic and research mandates.

Sincerely,

Baldassarre Stea, MD, PhD  
Professor and Head  
Department of Radiation Oncology
February 28, 2019

Jeff Goldberg, PhD
Interim Senior Vice President for Academic Affairs and Provost
c/o Pam Coonan
Executive Director, Academic / Curricular Affairs
P.O. Box 210128
Tucson, AZ 85721

RE: Proposal to Establish the Department of Neurosurgery, College of Medicine – Tucson as a New Academic Unit

Dear Provost Goldberg,

Enclosed please find our request to transition the College of Medicine – Tucson's current surgery division of neurosurgery to a free-standing academic department of neurosurgery. This is one of two requests to establish new academic departments we are submitting with a desired implementation date of July 1, 2019.

Though the division of neurosurgery falls within the department of surgery, it is comprised of numerous subspecialties that provide academic and clinical contributions to the College of Medicine - Tucson. It is well aligned with our strategic plan to develop a neuroscience clinical service line and efforts to expand the UA Center for Innovation in Brain Science. I believe granting it department status will enhance its profile within the college and university, and allow for further growth and national recognition.

In colleges of medicine, it is common that in large departments with multiple subspecialties (e.g., surgery) that subspecialty divisions sponsor their own residency programs, create and teach their own medical student electives and/or rotations, manage their own clinical service and conduct and manage research unique to their subspecialty. Neurosurgery fits this profile and eighty-seven percent of all academic neurosurgery programs with residencies are free-standing departments. We expect that the transition of neurosurgery from a division to a department will increase its national visibility and reputation, enhance our ability to recruit outstanding residents and faculty and improve the financial position of the clinical enterprise, thus better serving the people of Arizona.

We would like to implement this change at the beginning of fiscal year 2019-2020. If you have
questions or need additional information regarding this request, please do not hesitate to contact Michael Lemole, Judy DiMarco or me. We appreciate your support.

Sincerely,

Irving L. Kron, MD  
Senior Associate Vice President, UA Health Sciences  
Interim Dean, College of Medicine  
Professor, Surgery
**BUDGET PROJECTION FORM**

**Name of Proposed Program or Unit:** Department of Neurosurgery

<table>
<thead>
<tr>
<th><strong>Budget Contact Person:</strong> David Elmer (<a href="mailto:delmer@email.arizona.edu">delmer@email.arizona.edu</a>)</th>
<th>1st Year 2019 - 2020</th>
<th>2nd Year 2020 - 2021</th>
<th>3rd Year 2021 - 2022</th>
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**METRICS**

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<td>Net increase in annual college enrollment UG</td>
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<td>New Sponsored Activity (MTDC)</td>
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**FUNDING SOURCES**

**Continuing Sources**

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<td>UG RCM Revenue (net of cost allocation)</td>
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<td>Grad RCM Revenue (net of cost allocation)</td>
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**One-time Sources**

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<td>College fund balances</td>
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<td>Institutional Strategic Investment (UAHS funds)</td>
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<td>Gift Funding (Endowment Principal)</td>
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**EXPENDITURE ITEMS**

**Continuing Expenditures**

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<td>Employee Related Expense*</td>
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<td>Graduate Assistantships</td>
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<td>Other Graduate Aid</td>
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<td><strong>Total Continuing</strong></td>
<td>$3,290,032</td>
<td>$3,939,171</td>
<td>$3,944,914</td>
</tr>
</tbody>
</table>

**One-time Expenditures**

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction or Renovation</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
</tr>
<tr>
<td>Start-up Equipment</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
</tr>
<tr>
<td>Replace Equipment</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
</tr>
<tr>
<td>Library Resources</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
</tr>
<tr>
<td>Other Items (attach description)</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
<td>$1,840,000</td>
</tr>
<tr>
<td><strong>Total One-time</strong></td>
<td>$3,290,032</td>
<td>$3,939,171</td>
<td>$3,944,914</td>
</tr>
<tr>
<td><strong>TOTAL EXPENDITURES</strong></td>
<td>$3,290,032</td>
<td>$3,939,171</td>
<td>$3,944,914</td>
</tr>
</tbody>
</table>

**Net Projected Fiscal Effect**

<table>
<thead>
<tr>
<th>Source</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Projected Fiscal Effect</td>
<td>$241,771</td>
<td>$184,895</td>
<td>$37,777</td>
</tr>
</tbody>
</table>

*ERE is a blended Banner / UA rate for clinical faculty
d

Reallocation from existing College funds includes:

- State and Designated Funds | $385,646 |
- Banner Academic Funds Flow | $152,552 |
- Banner Leadership Funding | $188,841 |
- **TOTAL** | $727,039 |