From Research to Write-Up

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Getting Started

Identify a Research Question

Gap in Knowledge

Limitation in Patient Care

- **Diagnosis**
- **Treatment**
- **Prognosis**

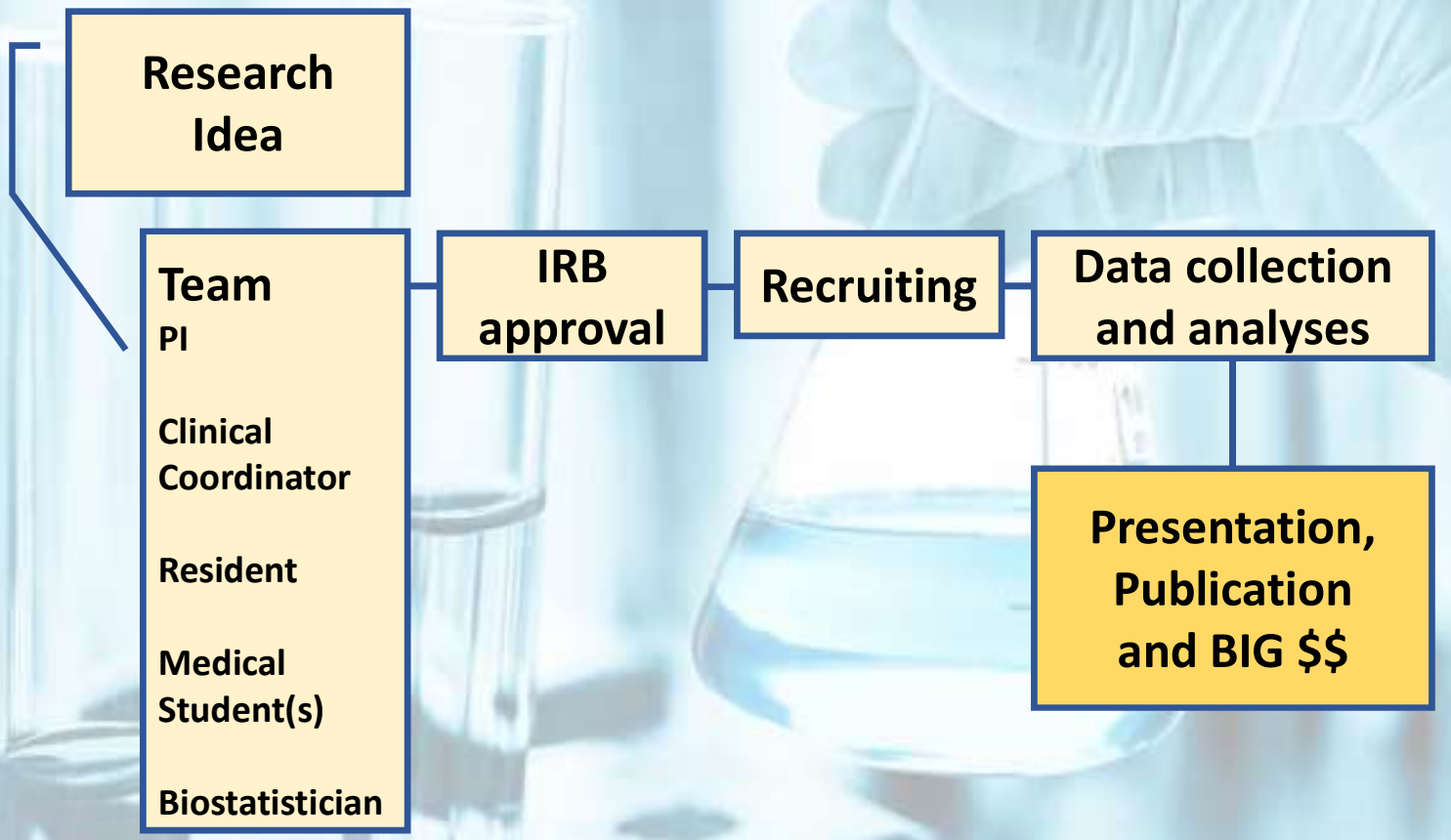
What has been done already??

To write the RATIONALE:

Review the Current SoC

Review the Literature

From Research to Write-Up



IRB

Start with a template/example of a successful protocol

(Approved)

Difficult the first time navigating the online process

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Summary/Abstract

Identify the problem

- Diagnosis
- Treatment
- Prognosis

Rationale for Study

- Previous research

Study Objective

Brief Design

Hypothesis

Clinical Significance

Build Research Team

From Research to Write-Up

Research Idea

Team

PI

Clinical Coordinator

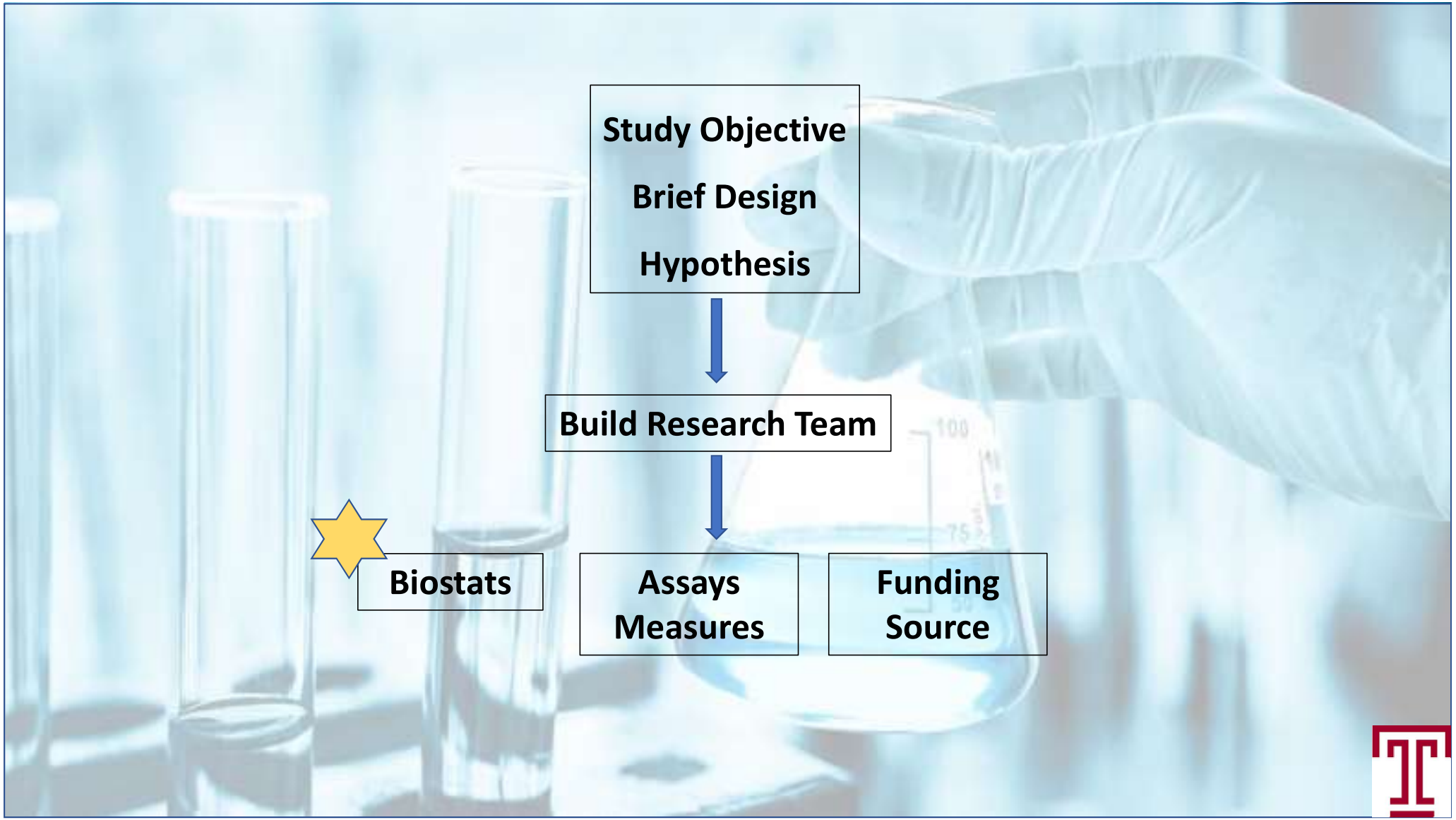
Resident

Medical Student(s)

Biostatistician

TEAM & TIME!!!

From Research to Write-Up


Study Objective
Brief Design
Hypothesis
Build Research Team
Biostats
Assays
Measures
Funding
Source

Statistical analysis

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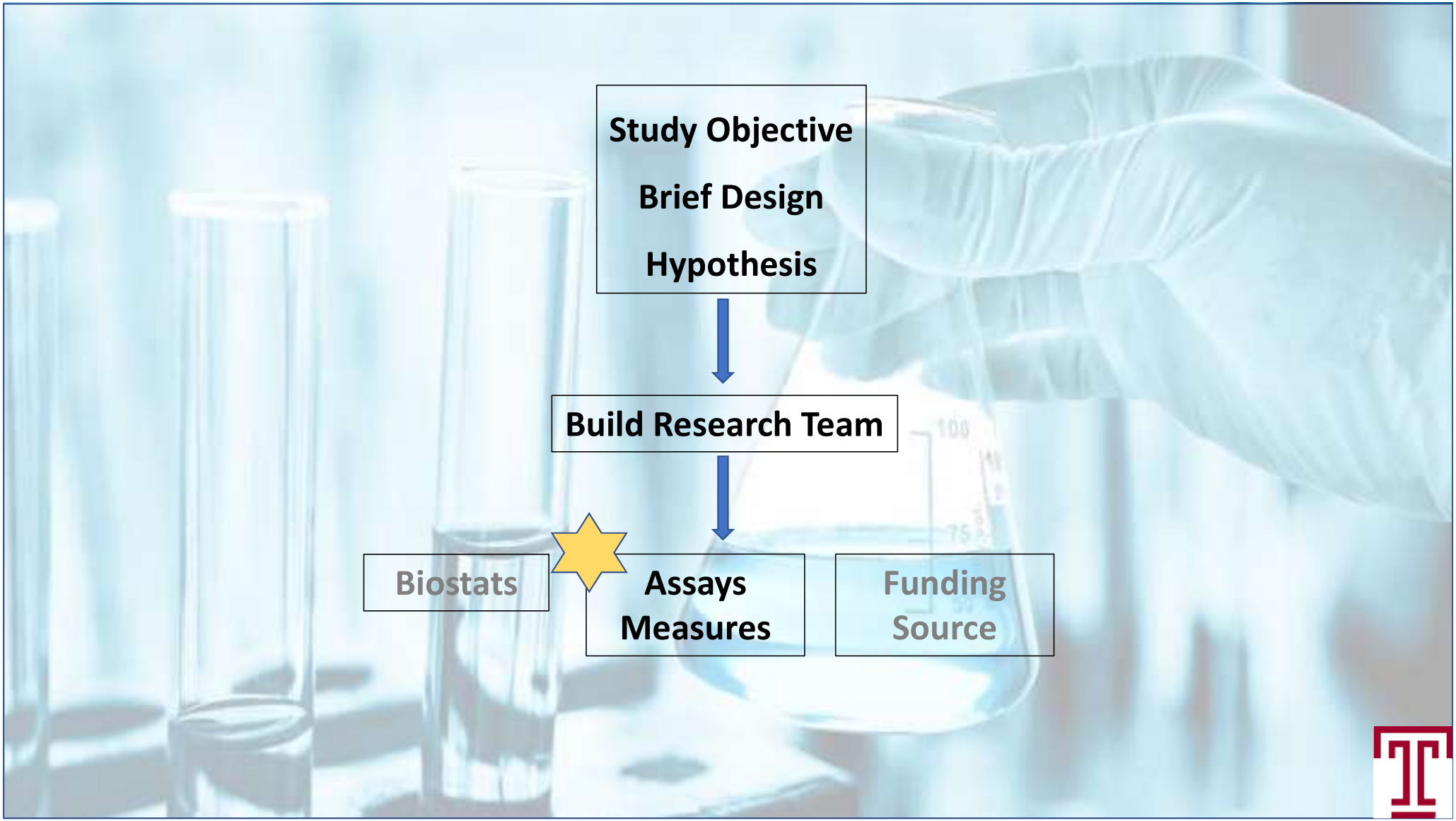
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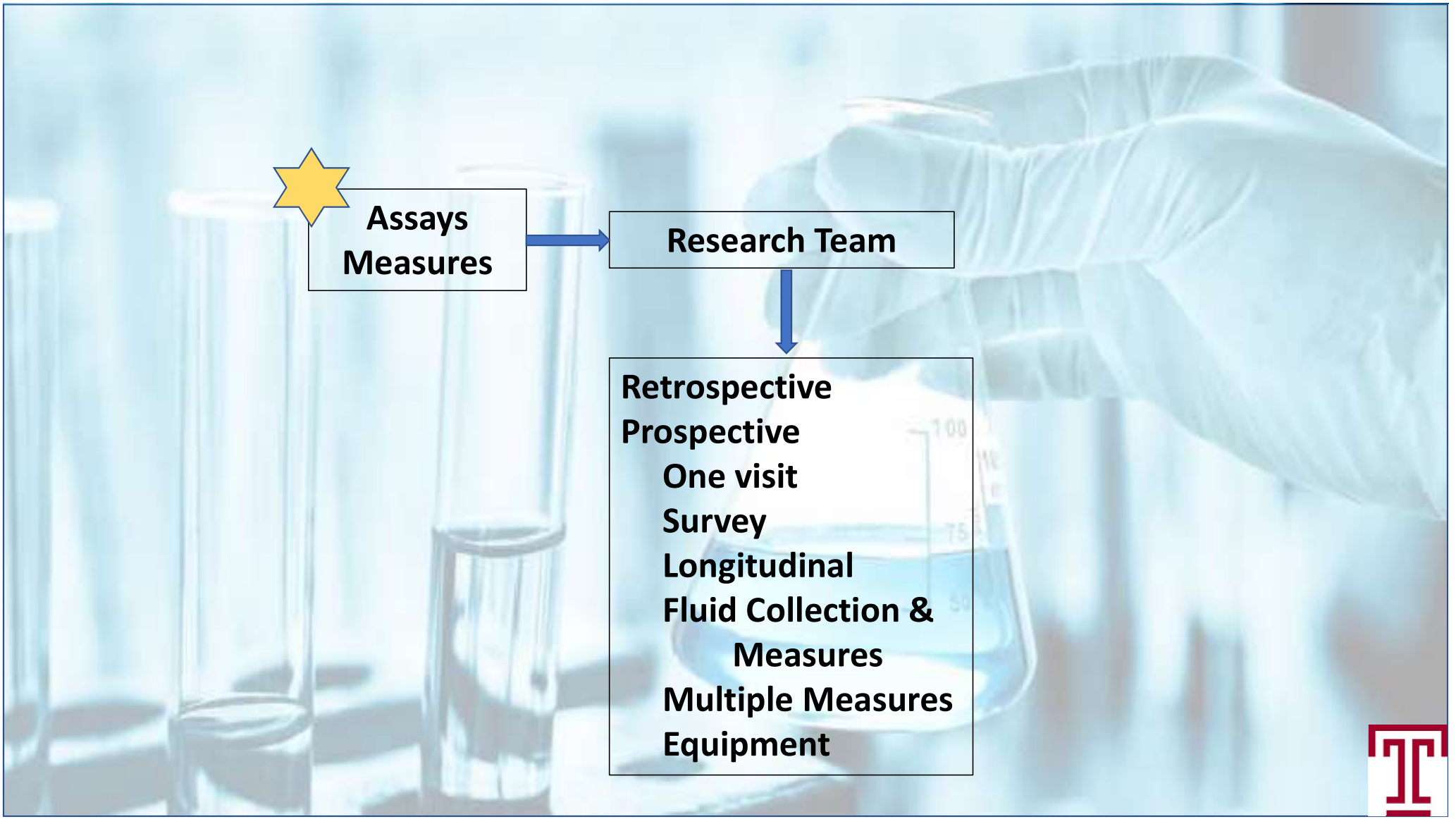
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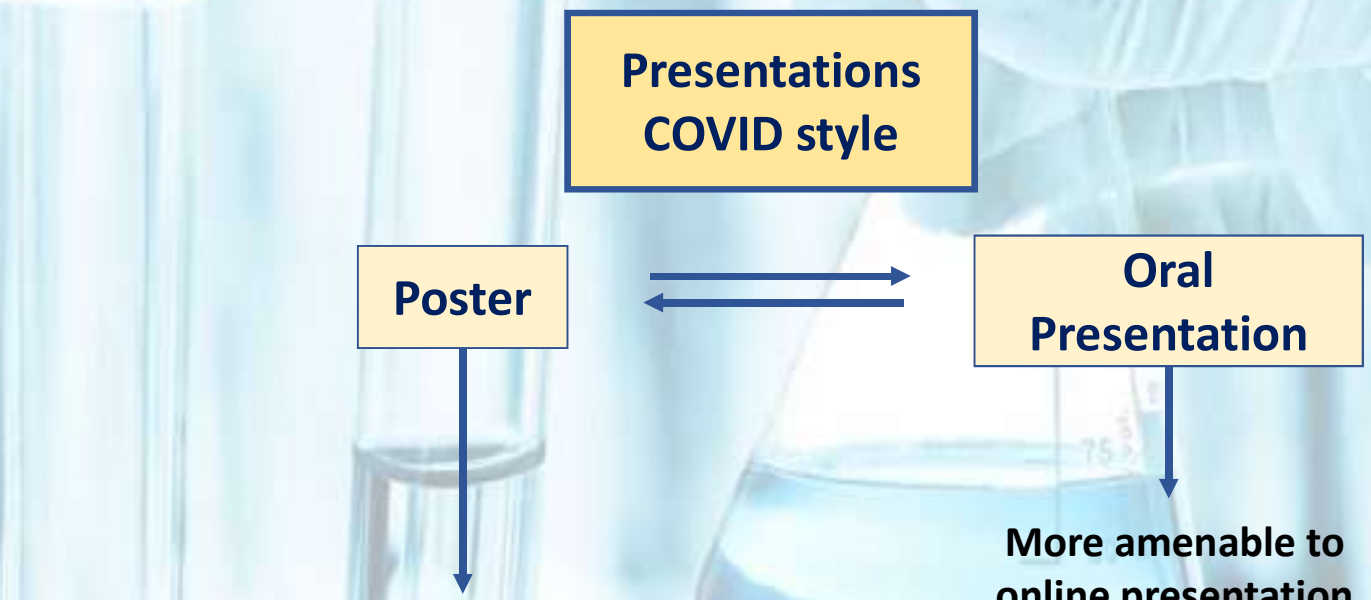
Retrospective
Prospective
One visit
Survey
Longitudinal
Fluid Collection &
Measures
Multiple Measures
Equipment

From Research to Write-Up



From Research to Write-Up

Posters

Background: history of progress
key players in process
challenges and limitations

Summary of: what
why
how
where
who
outcome
next steps

Making the POSTER: Want to create as a map for the reader that clearly leads from one step to the next. Create the poster as if you will not be there to guide audience through it.

Resolution of Co morbidities and Diabetes Mellitus Type II in Native Americans Following Bariatric Surgery

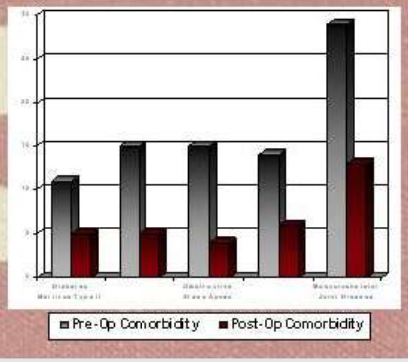
Hamed Abbaszadegan, MD; Melisa Celaya Cortes, MA; Robin Blackstone, MD

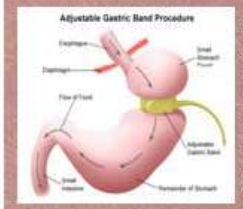
Scottsdale Bariatric Center; Scottsdale, AZ

Banner Good Samaritan Medical Center Department of Internal Medicine; Phoenix, AZ

Background

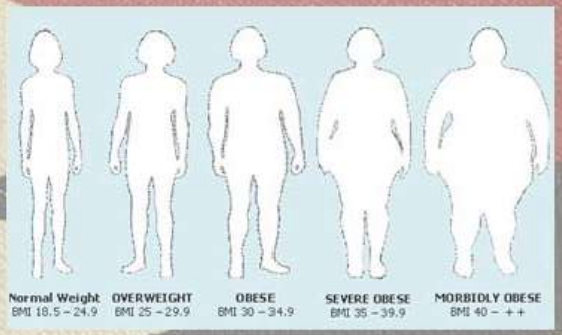
Roux-en-Y gastric bypass (RYGB) has been shown to improve health in obese patients. Of note, studies have shown improvements of HbA1c values, insulin resistance, beta-cell function, attenuation of peripheral insulin resistance, improvement of glucose control within 1 month postoperatively, and decrease diabetic medication requirements (1, 2, 3, 4, 5). Factors associated with remission were the preoperative insulin dose and the percentage of excess weight loss (1). One study showed that RYGB improves diabetes resolution by early increase in beta cell function at 1 month, and attenuation of peripheral insulin resistance at 6 months (2).





Introduction

The unique predispositions and prevalence of obesity makes the Native American population a high priority for intervention. Weight loss has been shown in other populations to influence the development and course of diabetes. Recent recommendations by the ADA have suggested that surgery may be an important treatment in the control of diabetes. This study reviews surgical treatment of obesity in a cohort of Native American patients from Arizona including surgical preoperative co morbidities (especially diabetes) and postoperative outcomes.



Methods

A retrospective analysis of prospectively collected data from November 2001 to November 2008 was performed in Native Americans that underwent gastric bypass (N=22; 75.9%) and laparoscopic adjustable gastric band surgery (N=7; 24.1%) in a community hospital. Descriptive analyses were executed to assess preoperative factors and comorbidities, postoperative complications, and improvement or resolution of disease.

Pre-Operative Comorbidities (Total Patients studied = 29)	Patients with Comorbidities	Percent Resolution of Comorbidities
Diabetes Mellitus Type II	11	45.5%
Hypertension	15	33.3%
Obstructive Sleep Apnea	15	26.7%
Dyslipidemia	14	42.9%
Musculoskeletal Joint Disease	29	46.4%

Results

Among the 29 participants, 86.2% patients are female, median age at surgery is 37.4 years, with the initial consultation median weight at 274 lbs. and BMI of 46.6. Preoperative comorbidities include Type II Diabetes (N= 1, 37.9%), hypertension (N=15, 51.7%), obstructive sleep apnea (N=15, 51.7%), musculoskeletal joint disease (N=29, 96.6%), and dyslipidemia (N=14, 48.3%). Resolution of comorbidities consists of Type II Diabetes (45.5%) confirmed by serial fasting glucose and HbA1C, hypertension (33.3%) confirmed after PCP stopped HTN medications, obstructive sleep apnea (26.7%) confirmed by repeat sleep study, musculoskeletal joint disease (46.4%) confirmed by subjective history, and dyslipidemia (42.9%) confirmed by fasting lipid panel. A significant difference in percent excess weight loss at 12 months between preoperative Type II Diabetics and normoglycemic patients was not confirmed.

Conclusion

The prevalence and severity of obesity and diabetes in Native Americans is amongst the highest in a population group in the world. Post operative comparison with non-Native Americans showed the effects of long term weight loss and resolution of comorbid disease as somewhat less. Unique cultural characteristics may be partly responsible for the lower response rate. Use of gastric bypass and laparoscopic gastric band surgery can aid in achieving long term weight loss and the resolution of comorbid disease.

References

(1) Kashyap, S., Lurix, K., Grant, J., Pryor, A., Rahemtulla, O., et al. Remission of Type 2 Diabetes after Roux-en-Y Gastric Bypass is Associated with Greater Weight Loss. Surgery for Obesity & Related Diseases. 2009; 5(3): 315-9

(2) Lee, E., Davis, S., Sreenivasan, J., Sweeney, J., Ziegler, T., et al. Dual Mechanism for Type 2 Diabetes Resolution after Roux-en-Y Gastric Bypass. American Surgeon. 2009; 75(6):498-502

(3) Nguyen, D., Mathiason, M., Kallies, K., Kothari, S. Effect of Laparoscopic Roux-en-Y Gastric Bypass Surgery on Hemoglobin A1c Levels in Diabetic Patients: a Matched-cohort Analysis. Surgery for Obesity & Related Diseases. 2009; 5(1): 4-10

(4) Inge, T., Bradley, D., Stein, J., Hamdan, M., Courcoulas, A., et al. Reversal of Type 2 Diabetes Mellitus and Improvements in Cardiovascular Risk Factors after Surgical Weight Loss in Adolescents. Pediatrics. 2009; 123 (1): 214-22

(5) Sinha, S., Hindocha, M., Evans, K., Nguyen, N. Remission of Diabetes after Laparoscopic Gastric Bypass. Department of Surgery University of California Irvine. Presented at the American College of Surgeons in Santa Barbara, CA. January 16-20, 2008

Cryptogenic Stroke in the Presence of an Atrial Myxoma

Hamed Abbaszadegan, MD; Jeremy Payne, MD, PhD
Banner Good Samaritan Medical Center Department of Internal Medicine (Phoenix, AZ)

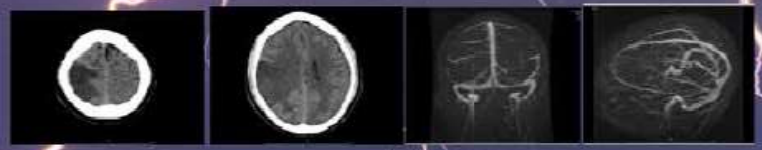
Introduction:

Strokes are often thought of as an occurrence in patients with risk factors such as long-standing hypertension, hypercholesterolemia, diabetes mellitus, "older" age, smoking, and genetic factors to name a few. It is not as common to see strokes in the younger age population (less than 40 years old), especially in the absence of cardiac/brain anomalies, right to left shunting, trauma, or endocarditis. When stroke occurs in this age group, the work up is often exhaustive to exclude clotting disorders, autoimmune conditions, and structural defects.

Case Report:

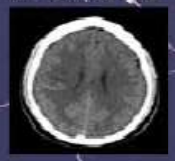
The patient is a 32 year old African American male with no known PMH who presented to the hospital with sudden onset of mild headache, left-sided weakness, and left spatial neglect. During the patient's admission, it was determined that he had an acute right parietal lobe ischemic infarct. Extensive work up did not find a definitive cause, but a right atrial myxoma was incidentally found. There was no clearly visualized patent foramen ovale, however a bubble study suggested a small degree of right to left shunting. No vascular anomaly on MRA imaging was found. Extensive lab work up which included coagulation studies, comprehensive drug screening, cultures, autoimmune etiologies, and lipid studies was unremarkable. The patient was discharged to acute rehab with a potentially cryptogenic stroke. Follow up is to include a repeat transesophageal echo to confirm the myxoma is still present which would then require surgical evaluation for excision.

Initial CT & MRA

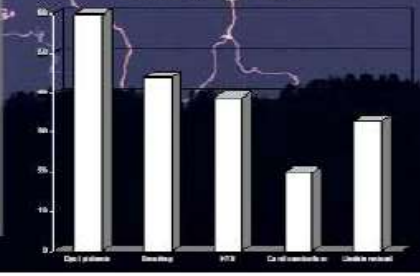


2nd CT

3rd CT, Day 9



Risk Factors for Ischemic Stroke Age 15-49



Transesophageal Echocardiogram

Discussion:

Often co-morbid disease, drug use, smoking, and other high risk activities can predispose patients to pro-thrombotic events. This was not the case in our patient. Etiologies to rule out before tagging a patient with a "cryptogenic" title should include: structural anomalies of the brain (CT + MR imaging), lipid profile, coagulation studies (factor V leiden mutation, anti-thrombin III, lupus anticoagulant, cardiolipin, prothrombogenic gene mutations, homocysteine), infectious etiologies, and auto-immune etiologies (Anti-nuclear antibody, rheumatoid factor). An embolic particle no larger than 1mm is sufficient to cause a clinically significant stroke. Despite no definitive R→L shunt, it is not impossible to imagine a small piece of the myxoma dislodging from an unseen small shunt.

*Annual Stroke rate for ages 15-49 = 10.8/100,000

References:
1. Kizer, Jorge. Evaluation of the Patient with Unexplained Stroke. *Coronary Artery Disease*. 2008; 19(7): 565-40.
2. Putaala, J., Metso, A., Metso, T., et. al. Analysis of 1008 Consecutive Patients Aged 15 to 49 With First-Ever Ischemic Stroke. *Stroke*. 2009; 40; 1195-1203.

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Team Approach to Palliation: Do No Harm!

Hamed Abbaszadegan, MD; Mona Amini, MD; Masood Kisana, MD
Banner Good Samaritan Medical Center/Carl T. Hayden Veterans Affairs Medical Center

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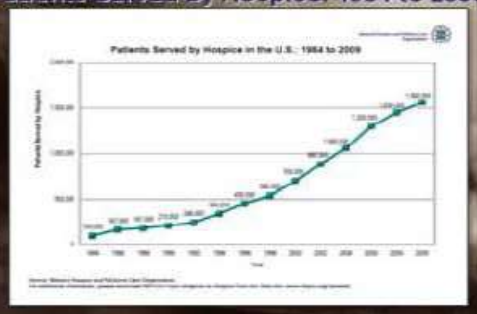
Introduction

Palliation involves easing the severity of pain, non-pain physical symptoms, and improving overall quality of life when the disease process cannot be reversed. The fine line between knowing when to allow natural death, and when to continue aggressive interventions is often skewed. The palliative care team at the Phoenix VA Medical Center has vastly changed the approach to end of life care utilization in the last year by improving utilization by [illegible].

Studies: health care expenses are utilized during the last year of life and are found to be mostly incurred in the last month of life. The utilization of palliative medicine is an important topic not just regarding health care expense, but is also significant when discussing patient safety when interventions will not change the [illegible]

Patients Served by Hospice: 1984 to 2009



References

Health Care (per capita) Cost Inversely Correlated with Quality of Life Score

Figure. Association between cost and quality of death in the final week of life (adjusted $P = .006$). Age, sex, education status, survival time, race/ethnicity, and source of report were controlled for in the adjusted analysis of per capita cost predicting quality of death in the deceased cohort ($n = 316$).

Case Report

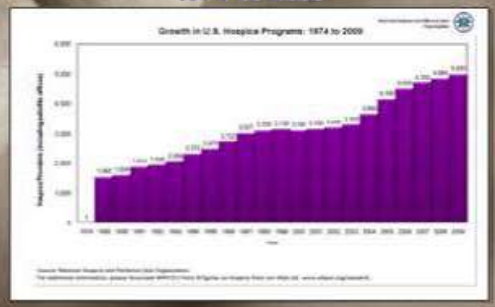
Patient is a 66 y/o Male with a 3 month history of progressive dysphagia to solids/liquids, and an associated significant weight loss. He was diagnosed with a metastatic esophageal adenocarcinoma with diffuse bony metastases confirmed by PET imaging. His symptom control became unmanageable at home secondary to recurrent hematemesis, fatigue, and anorexia to a point where a decision had to be made between aggressive interventions and allowing for natural death with dignity and comfort. Goals were established to control symptoms as a priority, as the metastatic cancer could not be reversed. By providing optimal pain relief, and relief of non-pain physical symptoms, aggressive agonizing interventions were avoided.

Conclusion

Terminal illness cannot be reversed. Once functional status declines to a point of irreversibility, palliation is an appropriate option for patient safety. Utilization through early involvement of palliative care improves quality of life, leads to less aggressive care, and results in longer survival. Research has shown that palliative medicine interventions not only improve survival, but are more effective than active treatment in many situations.

Advanced heart failure with recurrent exacerbations, advanced COPD, as well as cancers should be considered for palliation approaches as symptom management becomes the forefront of care. Families are often most satisfied with the care when they know their loved one has not been allowed to suffer needlessly.

Growth of Hospice Programs in U.S. 1974 to 2009



A Painful Syncope: Glossopharyngeal Neuralgia

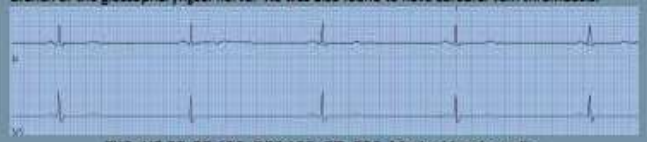
Briana Ketterer, MD - Department of Internal Medicine
Christie Binder, MD - Department of Radiation Oncology
Oregon Health & Science University, Portland, OR

Introduction

Glossopharyngeal neuralgia (GPN) is a rare disorder of the ninth cranial nerve in which paroxysms of severe pain are associated with excessive vagal outflow. This can result in bradycardia, hypotension, syncope and even cardiac arrest. This is likely mediated by the branch off the glossopharyngeal nerve that supplies the carotid body and carotid sinus which conveys chemoreceptor and baroreceptor information. This mechanism is responsible for the arrhythmogenicity and vasoplegia. Causes include neoplasm, infection, vascular malformations, Eagle's syndrome and prior surgical interventions. We present a case of GPN which resolved with treatment of a head and neck cancer.

Case Presentation

A 71-year-old-male presented with left sided headaches and symptomatic bradycardia three months following diagnosis of squamous cell carcinoma (SCC) of unknown primary with bulky left cervical adenopathy. He described a constant dull left sided headache with paroxysms of sharp, stabbing, and shooting pain lasting seconds at a time. The paroxysms were associated with hiccups, anxiety, an impending sense of doom, bradycardia to the 40s, and hypotension to 50s/30s. To stabilize his autonomic symptoms, he required intravenous atropine pushes and a dopamine infusion. A temporary pacemaker was placed. Imaging revealed progression of his left cervical tumor. It measured 3.4cm x4.4cm x 5.1cm with infiltration into the parotid gland and parapharyngeal space. This caused compression of the carotid artery near the carotid sinus branch of the glossopharyngeal nerve. He was also found to have cerebral vein thrombosis.



EKG: HR 35, PR 126, QRS 100, QTc 396. Marked bradycardia.

Glossopharyngeal Neuralgia

Glossopharyngeal neuralgia (GPN) was first described in 1910 by Weisenburg and the term "glossopharyngeal neuralgia" was coined in 1921 by Harris. The first case of cardiac arrest and syncope associated with GPN was published in 1942 by Wortis *et.al*. This is a rare craniofacial pain syndrome. Katusic published a 39-year retrospective study (1945-1964) calculated an incidence of 0.7/100,000 population/year. And syncope is even less common. In 1981 Rushton *et.al* reported 217 patients admitted to the Mayo Clinic with GPN. Only two patients experienced syncopal events.

Syncope is a result of extreme bradycardia and even asystole preceded by intermittent lancinating pain in the oropharynx, retropharyngeal space and occipital-temporal region with occasional radiation to the ear. The mechanism is not fully understood but the close connection of the vagus and glossopharyngeal nerve is presumed to create a vasoglossopharyngeal reflex arc whereby pain triggers arrhythmogenicity and vasoplegia.Thus, pain can activate the reflex and result in syncope.

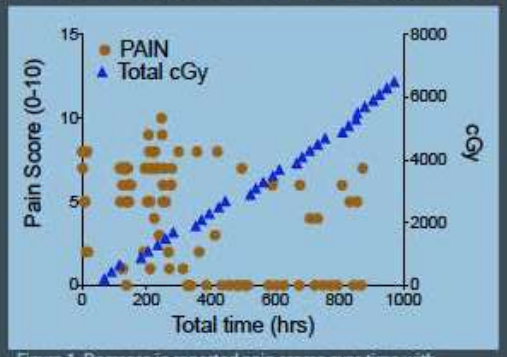


Figure 1 Decrease in reported pain scores over time with increasing radiation represented in cumulative centiGray (cGY).

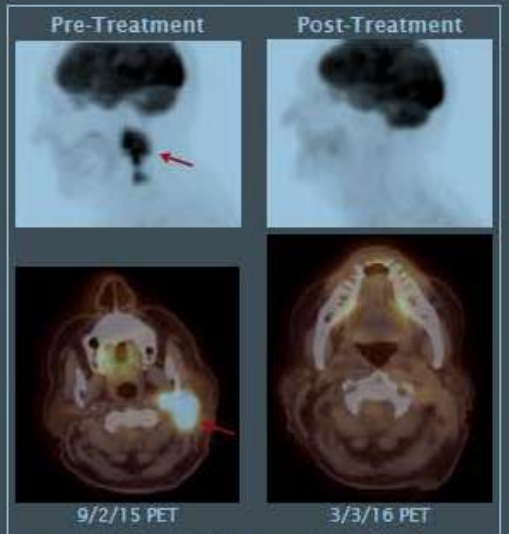


Figure 2 PET before (left) and 6-months after (right) treatment with chemoradiation. Red arrow points to tumor.

Glossopharyngeal Nerve

The glossopharyngeal nerve is the ninth cranial nerve (CN IX). It emerges from the medulla and traverses the cranium through the jugular foramen with the vagus nerve (CN X) and the spinal accessory nerve (CN XI). It has several components and functions:

- Somatic Motor: motor to stylopharyngeus for swallowing
- Visceral Motor: parasympathetic innervation to the parotid gland
- Special Sensory: visceral sensation from the parotid gland, carotid body and sinus, pharynx and middle ear
  - Carotid body and sinus (Nerve of Hering): chemoreceptor and baroreceptor
- Somatic Sensory: taste to the posterior third of the tongue and cutaneous sensation from external ear

Glossopharyngeal nerve (CN IX) anatomy.
Adopted from Clinically Oriented Anatomy for Review.

Therapy and Resolution

There is no standard treatment for GPN due to the variety of causes. Case reports describe improvement with medical therapy alone with antiepileptics such as carbamazepine, gabapentin and amitriptyline. Other reports show improvement with microvascular decompression surgically or with stereotactic radiosurgery. Given our patient's bulky, invasive, Stage IVa (TxN2bM0) p16+ SCC, he was treated with chemotherapy and radiation in conjunction with neuromodulating medications. He completed thirty-two radiation treatments to a cumulative dose of 65Gy concurrently with cisplatin. This decreased the size of the mass as seen in Figure 2. His pain and hemodynamic symptoms improved with therapy. He self reported lower pain scores with increasing cumulative Gray as seen in Figure 1. With improvement in symptoms of pain and syncope, the temporary pacemaker was removed, and he was transitioned to maintenance therapy with gabapentin. In this instance, he achieved sustained resolution of GPN and its hemodynamic consequences with chemotherapy and radiation to his left cervical mass.

Conclusion

This case displays how a large squamous cell carcinoma resulted in a painful syncopal phenomenon called glossopharyngeal neuralgia. It also reveals how chemotherapy and radiation produced symptomatic relief. While this is a rare entity, it is worthwhile for both general practitioners and subspecialists to draw a connection between facial pain syndromes and syncope as it may prevent life threatening complications.

References Available on Request

Hidden in Plain Sight:

False Reassurances Obscuring a Case of Intravascular Lymphoma

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Department of Medicine, Oregon Health & Science University, Portland, OR

OHSU

VA HEALTH CARE — Defining EXCELLENCE in the 21st Century

Introduction

An ill 67 year old man presents with weakness and profound failure to thrive immediately following an episode of syncope.

Background

- For the preceding **6 months**, he has been undergoing an exhaustive workup for chronically progressive B-symptoms and elevated inflammatory markers, including ferritin 1600 ng/mL, CRP 18 mg/L, ESR 94 mm/hr, and LDH 300U/L without hemolysis.
- Wife additionally describes **1 year** of "personality changes" including sudden anger, anxiety, and extremely vivid dreams – all new.
- Thought to have polymyalgia rheumatica, he received escalating doses of prednisone, up to 60mg daily for over a month, which briefly improved symptoms though were stopped given transient efficacy and development of significant anasarca, transudative pleural effusion, pericardial effusion, and progressive weakness.
- Over the **2 months** preceding admission, he experienced progressively worsening dyspnea, weakness, and dysphonia against a background of a more gradual decline in renal function and persistent sinus tachycardia without a satisfactory diagnosis.
- Outpatient workup includes:
  - negative ANA, ANCA, RF, PPD, viral hepatitis, HIV, lyme testing
  - SPEP, UPEP, IgG, IgA, and iron studies within normal limits
  - reassuring CT Chest, Abdomen, Pelvis (mild splenomegaly)
  - normal bone marrow biopsy
  - PFTs notable for obstructive disease with low DLCO
- Unremarkable past medical history, family history, medications
- Social history: Accomplished jazz saxophonist, working "up until a few weeks ago". No cigarettes or alcohol since age 27. No IVDU.

Presentation

- Reports syncope while walking slowly after 1 day of acute on chronic dyspnea in setting of a week of worsened fatigue, lack of appetite, dysphonia, and profound weakness.
- **Review of Systems:** Continued B-symptoms. No chest pain, palpitations, cough, urinary symptoms, diarrhea, vomiting, or evidence of bleeding.
- **Vitals/Exam:** afebrile, HR 111, BP 81/50, RR 26, O2 93% on room air. Thin white male, no acute distress, mildly confused though otherwise neurologically intact, dry mucous membranes, irregularly irregular tachycardia, decreased left base breath sounds with normal work of breathing, 3+ lower extremity edema to mid back.
- **Pertinent Labs:** Hb 7.1, MCV 74, WBC 6.8, platelets 168, Na 126, Cr 1.7, CK 2, Albumin 1, and lactate 5.5 which improves with crystalloids. CRP 18, ESR 140, LDH 287

Hospital Course and Transfer

- Initially admitted to the ICU, presumptively treated for septic shock, adrenal insufficiency, and anemia with antibiotics, 2g methylprednisolone IV daily and blood transfusions for several days without clinical or diagnostic progress.
- **Consideration for insidious malignancy such as intravascular lymphoma entertained, but ruled out** due to normal peripheral blood flow cytometry and cytogenetics (along with recent normal bone marrow biopsy).
- Transferred to tertiary care center for continued workup and care.
- Upon arrival, noted to be mildly tachycardic and tachypneic though saturating 100% on room air. Recommendations placed for further imaging, labs, and studies **including a skin and fat pad biopsy**.
- However, within 24 hours of arrival patient suddenly began gasping for air with rapidly deteriorating bradycardia. He was found to be in PEA arrest and unfortunately died.
- Autopsy confirmed **diffuse organ involvement of intravascular diffuse large B-cell lymphoma**.
- Immediate cause of respiratory arrest attributed to **"severe leukostasis" of "alveolar capillaries congested with neoplastic cells"**.

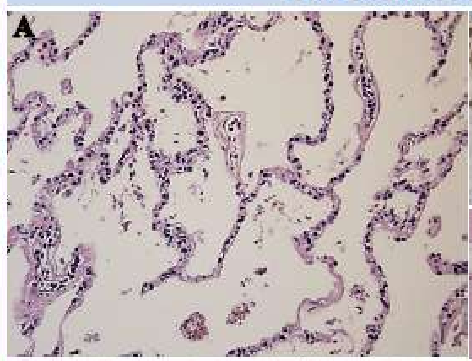
Extent of Organ Involvement

Specifically noted on pathologic examination to involve microcirculation of the following organs:

- Lung **(fig. A)**
- Aortic vasa vasorum
- Thyroid
- Kidney
- Prostate
- Stomach
- Spleen
- Skin **(fig. B)**
- Central Nervous System:
  - Basal ganglia **(fig. C)**
  - R frontal **(fig. D)** & occipital cerebral cortex
  - Pituitary gland (anterior and posterior)
  - Choroid plexus of medulla
  - Thalamus
- Coronary arteries
- Skeletal Muscle
- Adrenal glands
- Bladder
- Testicle
- Colon
- Liver

Note: **NOT** seen in bone marrow or lymph nodes

Pathologic Findings



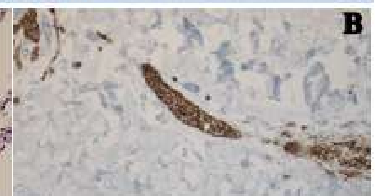


Figure A: Diffuse congestion of neoplastic B cells within pulmonary alveolar capillaries
Figure B: CD20+ staining of transected microcirculation from a superficial skin biopsy
Figure C: Densely packed neoplastic cells within vasculature of the basal ganglia
Figure D: Transected microcirculation of the frontal cortex exhibiting diffuse involvement of neoplastic cells

Discussion

- Intravascular lymphoma is an extremely rare subtype of extranodal diffuse large B-cell lymphoma characterized by **tumor proliferation within the lumina of small blood vessels**.[1]
- The entity was first described in 1959 as "angioendotheliomatosis proliferans systemisata" by Pfleger and Tappeiner, who theorized the malignancy derived from the endothelial cells themselves.[2]
- Given its rarity and nonspecificity of symptoms, diagnosis is difficult: over 60% of cases involving CNS are diagnosed postmortem.[3]
- **Only 5-9% of cases of intravascular lymphoma are detectable in peripheral blood.**[1] Small studies point to aberrant expression of markers which home to endothelial cell surface ligands, or aberrant lymphocyte homing and transvascular migration signaling.[4,5]
- Therefore, a **random skin biopsy is the diagnostic test of choice.**[6,7,8]
- In this case, presence of intravascular lymphoma was in fact suspected at the referring hospital, **though prematurely ruled out given normal bone marrow negative peripheral cytogenics and peripheral flow cytometry**. Nevertheless, disease involvement was clear on postmortem skin biopsy.
- This case illustrates key characteristics that can increase suspicion:[9]

	Anemia	↑LDH; B_2-microglobulin	↑ESR	Hepatic/renal/thyroid dysfunction
Incidence	65%	80-90%	43%	15-20%

- The literature further describes two distinct phenotypes: Western and Asian, which vary in organ involvement.[9] Interestingly, this case transcends the International Consensus Guidelines:

	CNS	Skin	Bone Marrow	Liver, spleen
Western	+	+		
Asian			+	+

- Early-diagnosed cases have been successfully treated with aggressive chemotherapy such as R-CHOP.[1]

Teaching Points

- Symptoms of intravascular lymphoma are nonspecific, though the **presence of an inexplicable inflammatory state, elevated LDH, anemia, and organ dysfunction** can raise suspicion.
- Definitive diagnosis is made via **random skin biopsy**.
- Distinction between Asian and Western phenotypes are not clear-cut.

References

1. [illegible] Intravascular Lymphoma: The Oncologist's "Great Imitator." The Oncologist. [illegible]
2. Pfleger L, Tappeiner J. [illegible]
3. [illegible]
4. [illegible] Intravascular large cell lymphoma: [illegible]
5. [illegible] Lack of CD 29 [illegible] and CD 54 (ICAM-1) adhesion molecules in intravascular lymphomatosis. [illegible]
6. [illegible] Use of random skin biopsy for diagnosis of intravascular large B-cell lymphoma. [illegible]
7. [illegible] random skin biopsy. [illegible]
8. [illegible] Random skin biopsy and bone marrow biopsy for diagnosis of intravascular large B cell lymphoma. [illegible]
9. [illegible] Definition, Diagnosis, and Management of Intravascular Large B-Cell Lymphoma: Proposals and Perspectives From an International Consensus Meeting. JCO. [illegible]

Blocking PDGF-CC signalling ameliorates multiple sclerosis-like neuroinflammation by inhibiting disruption of the blood-brain barrier

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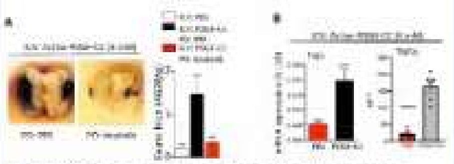
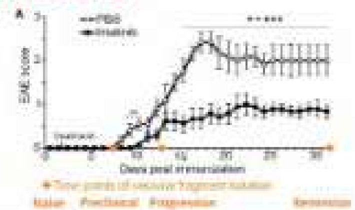
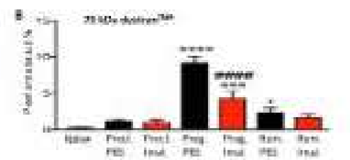
INTRODUCTION

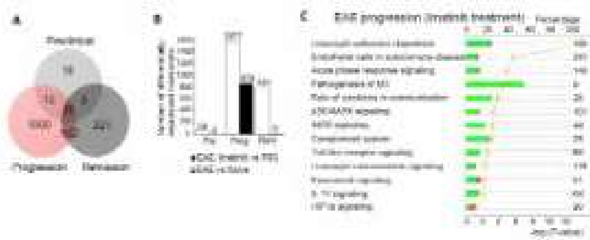


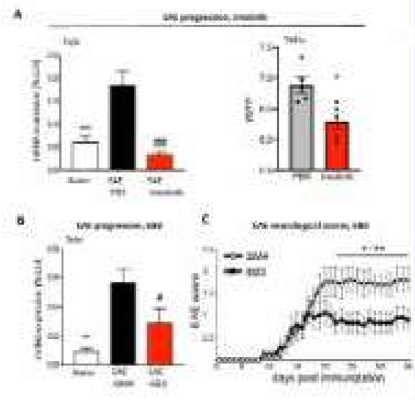
AIM

RESULTS









METHOD

CONCLUSIONS

- Dynamic transcriptional and phenotypic changes occur at the BBB during experimental autoimmune encephalomyelitis (EAE) in mice
- Both imatinib and a selective neutralising anti- PDGF-CC antibody counteract phenotypic and transcriptional changes at the BBB, correlating with amelioration of EAE

REFERENCES

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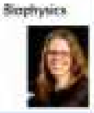
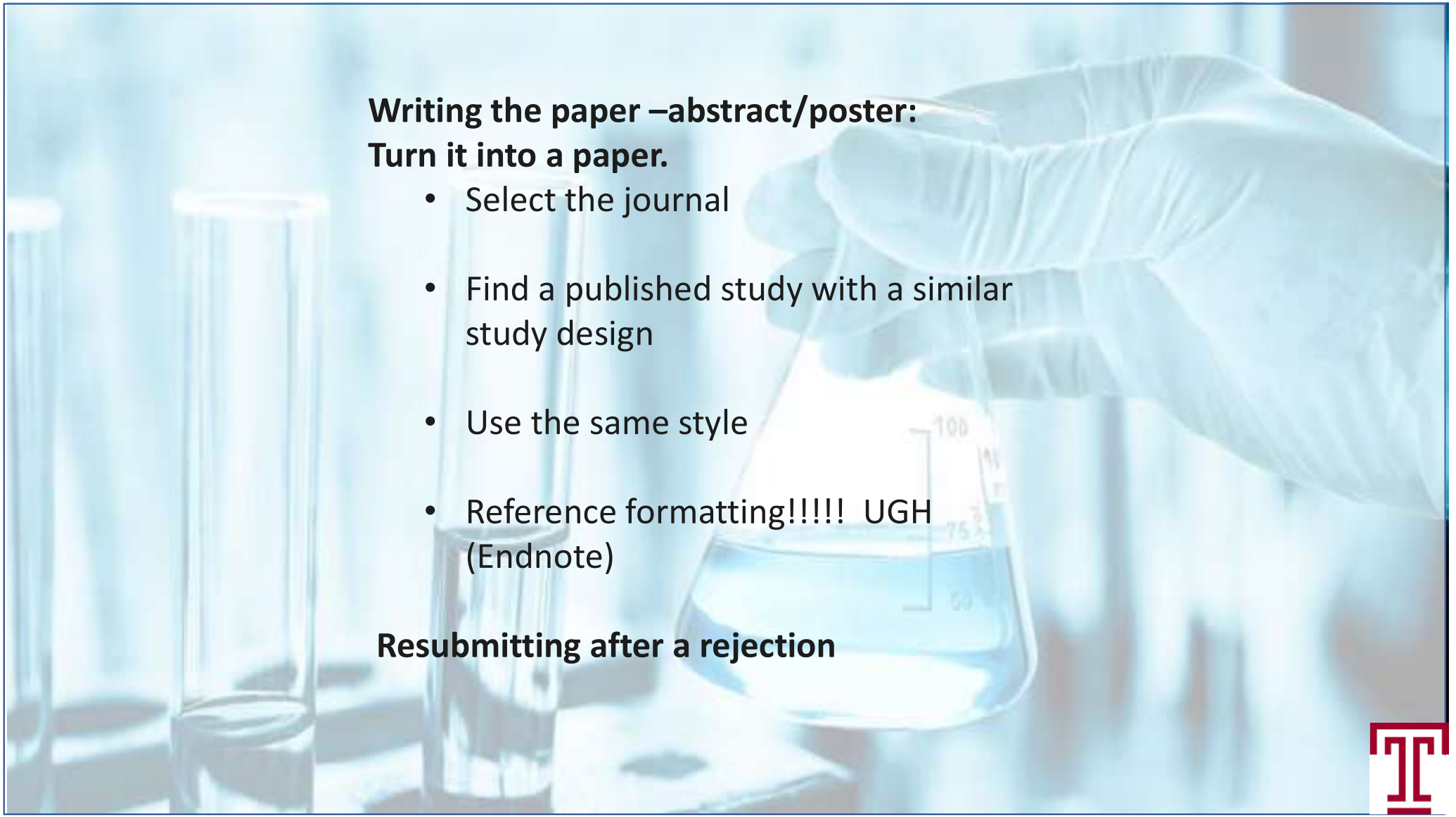




Writing the paper –abstract/poster:
Turn it into a paper.

- Select the journal
- Find a published study with a similar study design
- Use the same style
- Reference formatting!!!!! UGH (Endnote)

Resubmitting after a rejection

Abstracts

Space Constraints

Word Count

Specific Format

Disease/Disorder Topic

Significance and Knowledge Gap

Population/Cohort Studied

Research Setting (hospital/clinic)

Materials, Methods and Analyses

Outcome/Results

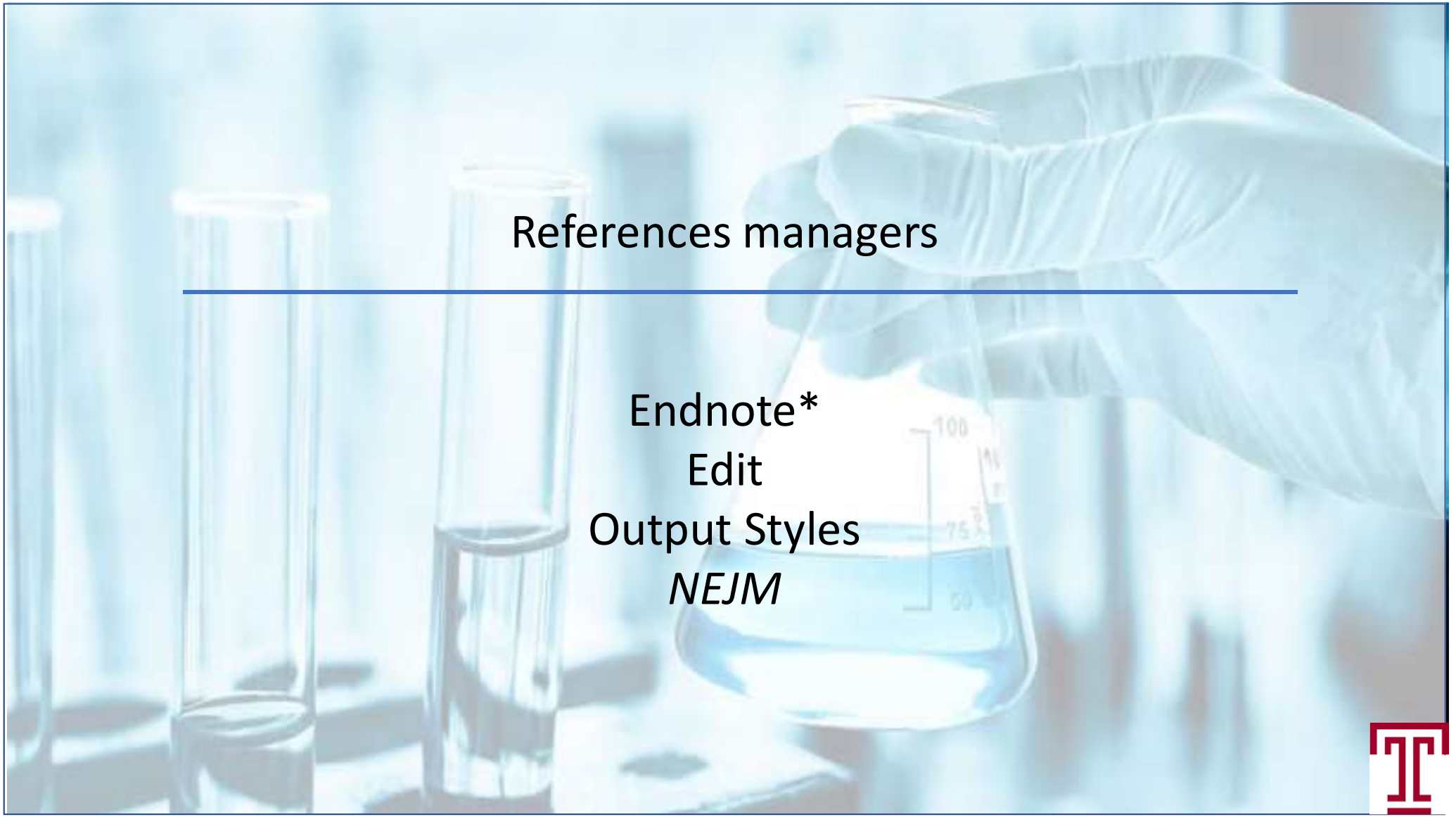
How findings improve health care/QOL

Next step based on these results

The NEW ENGLAND JOURNAL of MEDICINE

https://www.nejm.org/author-center/article-types

https://www.nejm.org/author-center/article-types



References managers

Endnote*
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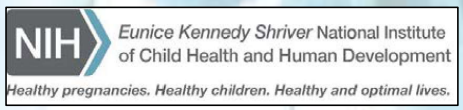
NEJM

Find Funding and Write the Proposal

Where to look??

NIH



Foundations

Professional Societies

Writing an NIH grant proposal

Start with a example of a proposal of the same series (R21, R01, etc)!

Work with your Administrator!

Most Difficult Part

Where to look??

NIH

Institute? https://www.nih.gov/institutes-nih/list-nih-institutes-centers-offices

Series? https://researchtraining.nih.gov/programs/career-development

ASK FOR HELP!

Questions and Moving Forward