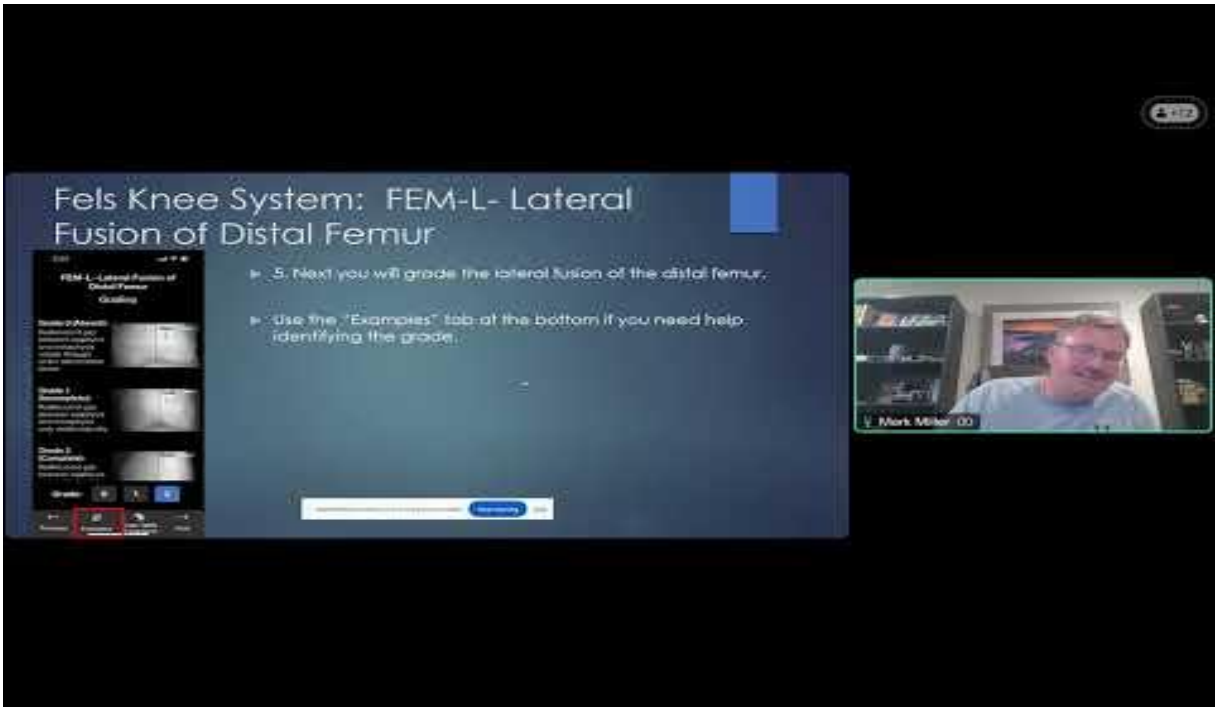
CORTICES ANNUAL MEETING SEATTLE

Meeting Minutes September 27-28th, 2024

FRIDAY MEETING VIDEO PT 1: https://youtu.be/1wpWldmG5JQ



FRIDAY MEETING VIDEO PT 2: https://youtu.be/IeijEGFsvqA

Attendance:

In-Person: Shore, Blumberg, Sanders, May, Schoenecker, Spence, Lempert, Upasani, Livingston, Rice Denning, Ramalingam, Beebe, Truong, Kadado, Sigrist, Li, Swarup, McGraw-Heinrich, Heyworth, Souder, Owen, Stepanovich, Riccio, Canizares, Venkatesh.

Online: Miller, Baldwin, Moore, Dell Mclaughlin, Emily Schwab, Burguess, Marino, Norman Lapin, Bagdadi, Joe Felsalbon, Hornfeck, Arkader, Syed, Laine.

Friday September 27th

6:30 AM to 7:30 AM: Postoperative Conference– Seattle Fellows/Residents/Faculty

Resident presented cases from trauma call and other specialties.

- Potential Future Study – Needs a Champion to Start
    - Hourglass in lateral view? Loss of flexion? Loss of ROM? What is the villian of the type IIs SHF?

8:20 AM to 8:30 AM: Welcome to CORTICES Fall 2024 – Seattle Presenter: Shore and Blumberg

- Shore welcomed the CORTICES members and those who joined virtually. He said one of the unintended benefits of the group is learning from one another. Shore emphasized the importance of the group's camaraderie, noting that their ability to get along is crucial for the group's success. He remarked that when people don't get along, the work simply doesn't function as well. The fact that everyone made the effort to attend in person, Shore said, is a great testament to the strength of the group. He added that while late-night work can be demanding, it's the moments of celebration and shared enjoyment that make it worthwhile.
- Shore also thanked Todd and his team for hosting the event this year.

8:30 AM to 11:00 AM: CORTICES Progress Report Block 1

8:30 AM: Tibia Nail - Skeletal Maturity App Training (Virtual)- Presenter: Miller

- Miller: Presented Skeletal Maturity App prior to launching the Beta testing for the project.
- He explained that the study is about patients with TibQ 0 (Skeletally immature Tibia fractures), but that there is still some resistance of operating on TibQ 1s, so it would be interesting to collect both and then break them down in the analysis. The minimum follow up for this study is at least 3 months.
- Potential Prospective study, hopefully we will have enough data to power the study, so we will undertake retrospective first.

  Comments:
  - **Heyworth:** BCH preliminary effort after analyzing 50 patients found 5 open physis. He asked at what skeletal age of skeletal ranges does tibq1 fall under: To what Miller replied that girls 13 ½ to 14 ½ and boys 14 ½ and 15- ½.
  - **Heyworth:** Asked in patients with less than one year of growth remaining how important is it to prove this if none of us would be that worried about 1 to two years of growth remaining?
  - **Miller:** looking at data there were not tibq1 until Miller became an attending, i don't think TibQ1 is going to show us deformity, but saying definitely that there is no deformity is the point. At WUSTL after reviewing 21, he found that 4 were TibQ0.
  - **Upasani:** Most of the journals that you're going to target are going to require more than a year of follow-up to publish something on growth.
  - **Group:** We should analyze at least one year of follow up at minimum, TibQ0s two or more years of follow up, TibQ1s one year of follow up.
  - **Miller:** Suggest collecting 3 months minimum of everyone

- **Heyworth:** Suggested that after finding who has physis open then we should use the Skeletal Maturity app to classify in TibQ1 and TibQ0. Using the app for screening all potential patients will be adding a lot of burden to the PI participating. Suggested only doing the Skeletal Maturity app after identifying skeletal immaturity not before.

Take-Home Points:

- Launch at 5 beta sites: WUSTL, BCH, Lurie (SSA), Rady (SSA), Vanderbilt (SSA) Colorado (SSA).
- Request a "lead investigator" from each site.
- Participating sites search for eligible patients with CPT and ICD codes.
- Use the Skeletal Maturity App to identify patients with open physis and select those eligible that are either TibQ=0 or TibQ=1.
- Add five cases to the REDCap once it's finalized and see how that works, and then we will start to share that with the rest of the group.

9:00 AM: Femoral Neck Fx Update- Presenter(s): Baghdadi & Larson

Study Overview:

- The study originally focused on femoral neck fractures in patients under 25, but it is now limited to those under 18.
- The study period covers from 2010 to June 2024, with patients presented, transferred to, or followed up at CORTICES participating institutions.
- To be included, patients must have initial injury films and at least some treatment data available if they were not treated at a CORTICES center.
- Data collection focuses on injury, treatment characteristics, and imaging data (e.g., CT, MRI, intra-op, and post-op imaging)
- Objectives: To assess current rates and risk factors for adverse outcomes, with a focus on avascular necrosis (AVN), return to the OR, and non-union.
- Lurie Children's Hospital found 204 patients using CPT/ICD codes, but only 62 had femoral neck fractures, and 15 patients were entered into REDCap.
- Data Collection and Progress: The REDCap database has been built at BCH, including three forms: Patient characteristics. Imaging details (pre-op, intra-op, post-op). Adverse outcomes and findings. Measurements are ideally performed by fellows or attendings.
  Contracts (SSA): Lurie and CHOA

Comments:

- **Shore:** asked if Soroush is still responsible for measuring everything? He suggested collecting non-ambulatory cases (CP) and spinning off a sub-study for that cohort, indicating why they differ and assessing their value. Shore also recommended focusing on soft exclusions while keeping everything categorized in REDCap. He emphasized that measurements should be done by attendings, not fellows, and proposed creating a measurement guide for this purpose. For radiographic review, he suggested identifying a "champion" at each site. Shore favored sending measurement numbers to REDCap instead of sending images.
- **Upasani:** questioned whether more patients should be excluded from the study. He agreed that central measurement would reduce bias caused by multiple readers.
- **Baghdadi:** mentioned plans to include UBC patients in the study, reasoning that their risk factors could be similar to traumatic cases. He reiterated that the key outcomes are complications, return to the OR, and general outcomes. Baghdadi suggested the efforts required for measuring should not be significantly different across cases.
- **Heyworth:** raised concerns about the effort and time involved in including pathologic fractures and suggested it might be better to create a separate substudy for these cases. He also inquired about proximal femoral fractures and their classification in the study.
- **Livingston:** asked whether the study is capturing the type of construct used in treatments, which Baghdadi confirmed.
- **Swarup:** questioned how the query was pulled and whether interobserver variability was being accounted for, to which Baghdadi confirmed variability was considered. He also advocated for a central review as methodologically better and suggested exploring how many institutions could manage image uploads.
- **Blumberg:** pointed out that a 1-year follow-up might not be sufficient, as patients could return post-operatively after that time frame.
- **Ramalingam:** proposed conducting a survey to compare screws versus fixed-angle constructs and nails.
- **Sanders:** expressed concern about difficulties in sending de-identified CT images between sites, noting that this could cause delays across institutions. She voted for focusing on a QI process and improving image upload protocols for the future.
- **Baldwin:** supported Shore's recommendation about avoiding image uploads, citing previous challenges at CHOP with sending images. He suggested a test dataset be created for reliability testing before measuring real X-rays.

Take-Home Points:

- Look at Soroush REDCap
- Boston will pull cohort
- Beta test sites are those that don't need IRB amendments, extend IRB date to 2024.
- Soroush to create a training guide for PIs for x-ray measurements at 5 Beta sites (reliability).
- Soroush to put cases together to look at treatment variation for surveying CORTICES.

9:30 AM: NFTI-WIFI Variable Update- Presenter: Ramalingam

Study Overview:

- Multicenter retrospective study of necrotizing soft tissue infections (NSTI) in pediatric patients.
- Inclusion Criteria: Patients aged 0-18 diagnosed with necrotizing fasciitis from January 2010 to June 2024. The infections must affect extremities, face, neck, trunk, or groin, based on ICD-9 (728.86) and ICD-10 (M72.6) codes. No exclusions.
- Next steps:
    - Finalize study protocol and submit to local IRBs.
    - Review the data dictionary and finalize REDCap.
    - Data Collection: Begin with an alpha test at Cincinnati, followed by beta testing at additional sites.

Comments:

- **Schoenecker** suggested changing the name from "NIFI-WIFI" to something aligned with adult literature, such as "NSTI" (Necrotizing Soft Tissue Infections) or a more memorable acronym like "PediNasty."
- **Schoenecker** also mentioned Dartmouth's use of fluorescence to visualize necrotizing tissue, which NIH has endorsed, highlighting the need for prognostic signs in this study.
- **Shore**: Asked for more specificity in coding co-morbidities, as research assistants might not know how to identify certain pathologies.
- **Blumberg**: Suggested including genetic diagnoses.
- **Shore**: Requested clarity on the definitions of "mechanism of injury" (MOI), especially regarding terms like "superficial" versus "punctures," and questioned the inclusion of causes like tattoos.
- **Blumberg** asked if a survey on institutional protocols should be conducted?
- **Ramalingam** clarified that a survey was unnecessary but agreed to include a question about institutional protocols in the data dictionary.

- **Shore**: Found the "system dysfunction" category vague.
- **Ramalingam** agreed to remove it since enough laboratory data would already be collected.
- **Swarup**: Asked for clarity on which time points should be collected daily, specifically questioning whether the earliest vital sign should be used.
- **Beebe** raised concerns about narrowing the cohort, noting that necrotizing fasciitis (Nec Fasc) is frequently mentioned in charts.
- **Shore**: Asked how the sites would generate a 20-patient population list.
- **Livingston**: Suggested using ICU stays as a clinical marker to limit the cohort.
- **Schoenecker**: Warned against excluding non-nec-fasc patients as they serve as a comparison group.
- **Shore**: Highlighted the difficulty RAs may face in gathering the number of lab time points and using scoring systems, especially those that require a medical knowledge base, such as Phoenix score.
- **Heyworth**: Recommended focusing on patients already labeled with necrotizing fasciitis to cast a wider net for data collection.

Take-Home Points:

- **Study Name**: Consider changing the name to align with adult literature, such as "NSTI" or an acronym like "NASTY."
- **Data Dictionary**: Collaborate with Copley to reduce the number of time points collected and ensure the data entry guide provides clear variable definitions for research teams.
- **Cohort Definition**: Consider adding enough information ensuring the study captures the relevant data from this rare population but balancing it to what is achievable.

10:00 AM: Lisfranc Retrospective- Presenter(s): Rice-Denning

Study Overview:

- Rice-Denning: Opened the discussion by reviewing the variable list for the LisFranc retrospective study, confirming that both the study aims and variables are ready for use.
- They plan to send the data dictionary to Boston for building the REDCap database.
- The team initially planned to send out a survey on treatment variation but faced technical glitches and decided not to deploy it.
- Pilot Test: TSRH, Cincinnati, and CHOP will test 5 patients each before expanding the pilot to other sites.

- The follow-up period will be 6 months. Although this may be short, it is considered practical for trauma patients.

Comments:

- **Shore:** Proposed centralizing the survey deployment, but each site must reach out for invitation and survey completion to avoid overburdening the BCH team while maintaining standardized data collection across all sites.
- **Upasani:** Suggested excluding open fractures from the study. Rice-Denning agreed, noting that excluding open injuries and penetrating trauma could lead to inconsistencies as they have different timing for treatment.
- **Rice-Denning:** Reviewed a comprehensive list of CPT codes and the inclusion criteria, confirming that the data would be updated to 2023.
- **Sanders:** Asked how the study would define "return to sports." Denning clarified that for study purposes, being cleared for sports participation will be used as a surrogate for actual return to play.
- **Swarup:** Raised a question regarding the consistency of CT or MRI data collection. Rice-Denning responded that the study would aim to gather weight-bearing X-rays at the final follow-up, but they expect some variability in availability. If they have other imaging available they will use the report or surgeon's interpretation.
- **Baldwin:** Mentioned that LisFranc injuries, while not uncommon, are difficult for many to treat. He suggested submitting an article to JBJS Essential Surgical Techniques on how to treat these injuries to help provide guidance.
- **Rice-Denning** noted that purely ligamentous LisFranc injuries in adults often include late adolescent patients. There is resistance to primary fusion in such cases.
- **May:** Mentioned the change in treatment over time, especially regarding dynamic fixation for ligamentous injuries.
- Rice-Denning: Added that it is challenging to counsel patients about these injuries, as many seek treatment elsewhere.

Take-Home Points:

- Survey: Flesh out the survey and distribute it to the group. If possible, the survey should be deployed from individual sites with troubleshooting support.
- The discussion and feedback from the survey will help define how the retrospective cohort is collected, ensuring consistency and clarity in the methodology.
- Post-Survey the Protocol and Data Dictionary will be sent to Boston to start study procedures

10:30 AM: Antibiotic Prophylaxis in Open Fractures Survey- Presenter: Livingston

Study Overview

- Livingston presented an update on the "Antibiotic Prophylaxis in Open Fractures Survey." The study aimed to describe institutional variations in antibiotic (ATB) prophylaxis for open fractures across 18 ACS Level 1 pediatric trauma centers. Findings showed inconsistency in timing and choice of antibiotics across institutions. Twelve sites had approved policies for antibiotic administration, five had none, and one was uncertain. There was no uniformity in the selection of antibiotics based on the Gustilo-Anderson classification, allergy alternatives, or environmental contamination (soil or water), revealing significant variability. Livingston suggested that CORTICES could further explore this topic, as the group represents about a quarter of ACS Level 1 trauma centers.

Comments:

- **Livingston:** noted that adult literature also shows variation, with institutions shifting from Gentamicin to Sozin as monotherapy. Infectious disease departments have different reasoning based on regional needs, but there's potential to establish consensus for grade III fractures in pediatric populations.
- **Baldwin:** shared that CHOP implemented an intervention to ensure outside hospitals administered antibiotics prior to transfers, which improved outcomes, though the effect diminished over time likely due to the Hawthorne effect. Nevertheless, hospitals continued to ask for antibiotics during transfers.
- **Swarup** suggested gathering actual protocols from institutions and holding small group discussions with high-performing centers to further strengthen the study.
- **Livingston** added that meeting with emergency departments (ED) to ensure antibiotics are administered correctly could be an effective strategy.
- **Sanders** pointed out the discrepancy between protocols and actual practice, where residents may not administer the intended antibiotics despite established guidelines.
- **Shore** emphasized the importance of surveys in framing these questions, noting that higher morbidity and resource utilization correlate with greater protocol variation, particularly in the rarest cases like type III fractures. Shore recommended focusing on antibiotics and time to treatment.
- **Schoenecker** proposed including the duration of antibiotic use in the study, as it's another variable with little consensus. He suggested a focus on type I fractures, where keflex is typically prescribed for 10 days, but noted that home administration of antibiotics should also be explored.

- **Livingston** agreed that this was an important, unexplored area with significant variation.
- **Heyworth** noted that Livingston's study offers a chance to create change and develop a consensus based on data, potentially resolving areas of resistance in antibiotic protocol adherence.
- **Shore** suggested that a retrospective study could lay the groundwork for future prospective studies on antibiotic compliance for open fractures.

Take-Home Points

- The study should focus on antibiotic prophylaxis for type III open fractures and gather protocols from different institutions to compare practice versus guidelines.
- Additionally, it may be valuable to explore antibiotic compliance and duration of administration.

10:50 AM: Thoracolumbar Burst Fx Survey - Presenter: Shore/Birch/Hedequist
Study Overview:

- The survey aimed to identify variations in on-call management practices across institutions, focusing on how children are managed by different specialties, including orthopedic surgeons and neurosurgeons.
- It sought to characterize non-operative and operative care to explore the heterogeneity in management approaches. The study found that about half of the institutions involved a combination of orthopedic and neurosurgical care, while fewer involved neurosurgeons alone.
- In Case 1, there was consensus on spinal decompression and fusion, but variation in the levels of instrumentation. In Case 2, treatment recommendations were split, with 50% favoring non-operative management and 50% recommending surgery, often with fusion, depending on the presence of neurologic deficits.

Comments

- **Shore** highlighted that CORTICES could help establish a consensus guideline for practice that could benefit smaller centers and demonstrate how pediatric orthopedic and neurosurgical care should be coordinated. He suggested comparing pediatric and adult standards of care by collecting cases and analyzing their treatment approaches.
- **Swarup** noted that managing these fractures is a significant clinical undertaking and recommended including more detailed information, such as imaging, to

classify injuries like burst fractures, chance fractures, and ligamentous injuries. This additional data would help refine treatment approaches.

- **Upasani** raised concerns about neurosurgeon's participation, noting that neurosurgical colleagues at some institutions may not be engaged in studies. He emphasized the importance of gathering retrospective data to understand standards across institutions where both orthopedic and neurosurgical teams are involved.
- **Shore** pointed out the variability in choosing the level of instrumentation and discussed the orthopedic burden on care. He suggested forming a retrospective cohort to better define both operative and non-operative cases.
- **Swarup** proposed that a trauma registry might facilitate this data collection, acknowledging that while it would require effort, it would be an efficient way to gather detailed case information.

Take-Home Points

1. Establish a consensus guidelines for the management of pediatric orthopedic spinal injuries with nerve involvement through CORTICES to standardize care across institutions
2. Collect detailed imaging and case data to refine treatment guidelines
3. Engage neurosurgical colleagues in the study to ensure comprehensive participation across institutions
4. Create a retrospective study to capture variability in operative and non-operative management, focusing on instrumentation decisions and care coordination. At this end Boston will create a more in-depth protocol and variable list to circulate to CORTICES members

11:10 AM to 12:00 PM: Membership, Website & Research Processes

11:10 AM: Research Committee Updates- Presenter(s): Canizares & Swarup

- The research committee has new members, one MD Swarup and 2 PhD level scientists: Moore, Canizares.
- The committee created a new research proposal form that will be completed in full for retrospective and prospective studies and will be much shorter for expedited studies: surveys, re-use of existing retrospective databases, and systematic reviews.

- The Committee modified the NIH scoring system to give applications a score in order to standardize the things that the committee evaluates. Especially clinical relevance, methodology and feasibility.
- The research process was presented highlighting the differences between retrospective and expedited studies.
- To improve the timeline of launching studies we will create a list of **"Beta test sites"** which are sites that don't need SSA contracts or a new retrospective IRB for each new idea. We will ask them to be our testers, and we will rotate so every study's REDCap gets vetted and moves quicker through the beta test.
- Surveys cannot be technically collected under the CORTICES IRB as the IRB is for collection of data, not contacting subjects. However, if the surveys are de-identified and you meet your institutional QI guidelines, they won't need a new IRB for each survey. Just make sure you are aware of the policies for surveys at your institution.

Take Home Points:

- The committee has a new research proposal form that will be shared with the meeting minutes.
- Any new retrospective proposal must complete the form in full and expedited proposals only to complete half of the form.
- The committee will review and score proposals and provide feedback.
- Sites that don't need an SSA and new retrospective IRB for each CORTICES study are sites that could help with Beta testing. The only thing these sites must do and confirm is that they updated the end date to **June 30, 2024.** These sites are:

Beta Test Taskforce	No SSA contract	Only update IRB date
Boston Children's Hospital	x	x
Children's Hospital of Philadelphia	x	x
Le Bonheur Children's Hospital	x	x
Texas Children's Hospital	x	x
CMC Dallas/TSRH	x	x
University of Michigan	x	x
Washington University in St. Louis	x	x
UCSF Benioff Children's Hospital	x	x (?)
Children's Hospital Los Angeles	x	
Nationwide Children's Hospital	x	
Seattle Children's Hospital	x	

11:20 AM: Marketing Committee: Website updates- Presenter: Venkatesh

- The previous website could not disseminate study information to all sites feasibly, only updated biyearly and was something we paid for as an organization. We now are able to update at any time at no cost and have more capabilities
- New updates include an internal page that allows an upgraded experience for CORTICES members so that we can share study information without having to go through Google Docs, Dropbox, or OneDrive
- The internal page is a space for members and tabs currently added are:
    - Newsletter
    - Active Studies
    - CORTICES Bylaws
    - Membership Points
    - Research Study Proposal
    - CORTICES Events

Take Home Points:

- BCH will be the host of the website as the company is internal to BCH.
- We will have the same home pages as before plus a record of our publications
- Our password protected internal site will have tabs for the publication's dashboard, active studies, newsletters, the research proposal, bylaws and membership point.
- Take Home Points: If you have a new Bio or Headshot please send it to Meghana. If you have any suggestions for other tabs, please let Meghana know.
- The Marketing Committee will be contacted after the Website is set up to review and discuss additional social media/marketing initiatives

11:40 AM: Membership Discussion. Presenter: Beebe

- **Membership Points:** New points were presented. The group agreed to the addition of giving points for hosting a meeting, creating a survey and completing a survey. Points modified, such as timeliness of data submission and cleaning, were also presented. There were no objections to the point system discussed, and it was accepted. The membership committee will circulate the Excel sheet with preliminary point tracking and request corrections if necessary.
- **Adding New Sites Discussion:**
    - **Group Structure**: The group agreed that since CORTICES is a study group, not a 501(c)(3), the level of detail and scrutiny does not have to be overly strict. However, it is important to clearly define how the group operates, and the processes involved.

- **Institutions of Interest**: Phoenix, Akron, and UCLA (Soroush) had previously expressed interest in joining. The application cycle had been closed for some time, and these institutions were asked to wait.
- **Application Cycle**: The suggestion was made to reopen the application cycle, but with the understanding that applications can be declined if they are not appealing. It was noted that inviting someone and then rejecting them could be problematic.
- **Selection Criteria**: A discussion arose about whether the criteria for new members should be based on the size and geographical location of the institutions.
- **Needs Assessment**: A proposal was made to conduct a needs-based assessment to determine what the group requires, particularly to ensure representation from underrepresented regions. It was mentioned that Phoenix seemed to be the most logical candidate to ask to apply at this time.
- **Invitations at POSNA**: It was suggested that prospective new members could be invited at the POSNA meeting. The idea was to reach out to potential members, ask if they would like to participate, and have them explain why they want to join CORTICES.
- **Application Feasibility**: Part of the application process should assess the feasibility and bandwidth of the applicants to actively participate. Akron and Phoenix were identified as top contenders for consideration.
- **Motivation for New Members**: The discussion shifted to the motivation for expanding the group. Shore mentioned that the group was not short on numbers and had a manageable size, but rejecting interested institutions without explanation could be perceived negatively. Regional coverage was seen as the main reason to add new members, and both Phoenix and Akron would contribute to this. It was suggested that after adding new members, the group could reassess whether the additions were successful, and criteria for this reassessment would need to be defined.
- **V**ote on New Site: Shore proposed adding "Up to one new site addition for POSNA" and asked for a vote. Although there was support for the proposal, it was noted that some members opposed adding new sites, making the vote not unanimous.

Take-Home Point:

- Most of the group agreed to consider increasing to a maximum of one more site, if said site meets criteria and need but the group does not need to select a site just to grow.
- Open the Application Cycle: Between New Year and POSNA 2025

12:00 PM to 12:50 PM: Picture

1:00 PM to 2:00 PM: CORTICES Progress Report Block 2

1:00 PM: Surgeon Preference. Presenter: Schoenecker

- Overview of Consensus Building Process:
    - Traditional Delphi processes can allow strong opinions to dominate and influence the final consensus. The method being used in CORTICES is designed to bypass this bias and achieve a more balanced outcome.
    - The team has submitted a grant proposal to POSNA and is seeking additional funding sources. Ishaan will lead the pilot study, focusing on ankle fractures.
    - The primary aim is to develop a CORTICES consensus on emergency room prioritization—specifically, which cases should be seen first, and which should be prioritized for the operating room.
- Educational Tool for Residents:
    - Currently, using this consensus-building tool for resident education. At Vanderbilt, PGY1 residents learn pathologies independently, while PGY2 residents struggle with prioritization. The goal is to expedite their learning, allowing them to gain experience quicker.
    - This system is taught to residents before they take on-call duties, and the tool helps them learn to prioritize cases appropriately.
    - The plan is to gather CORTICES members to refine and build consensus on which cases should go to the OR first. This is aimed at improving clinical intuition without hierarchical bias.
    - An app is being developed for residents, backed by CORTICES consensus. When a resident asks why one case is prioritized over another, the app will provide feedback and explanations based on consensus.
    - The app will offer immediate feedback after lectures and retest residents over time to ensure they are learning from the process.
- Agreement Map Visualization:

    - When asked, “What should you see first?” an agreement map was created. It visually represents the consensus, highlighting areas of agreement and disagreement across participants.
    - This tool identifies trends, showing which individuals or groups are in complete disagreement with the consensus, which can help refine the process.
- Publishing and Future Goals:
    - The primary objective is to prove that this consensus-building process works as an educational tool. The team aims to publish their findings in JPO or JBJS to establish a paper that can be cited in future work.
    - Keith suggested including statistical comparisons to demonstrate non-inferiority to the traditional Delphi technique, showing that the new method yields results that are either equivalent or better.

Take Home Points:

- This approach is designed to avoid dominance by strong opinions and achieve a fair, collective agreement.
- The tool has potential not only for improving resident education but also for publishing results and influencing clinical practice.
- The resident app will integrate real-time feedback and consensus, enhancing learning and decision-making.
- Statistical validation may be needed to prove this method's efficacy compared to traditional Delphi techniques.

1:30 PM: NAT Paper Topics. Presenter: Shore

- **POSNA Update Recap:** At the POSNA meeting, compliance for screening and the rate of NAT at CORTICES centers (n=1200) were reported, along with factors influencing screening, the overall rate of NAT, and related risk factors.
- **Database Revision:** Some institutions had extreme outlier rates (80-100%) or low numbers of femur fractures. Since POSNA, the cohort was revised, and the database expanded by 600 patients, resulting in a cohort of approximately 1800 patients.
- **Key Takeaways from the Study:**
    - The prevalence of NAT was found to be 20%, which could form the basis for a dedicated paper.
    - Significant differences in screening practices based on race were observed.
    - While treatment options are available, there is no data on outcomes. The group will instead focus on patterns of treatment.

- **Paper Sequence and Discussion:**
    - The goal is to determine the sequence of papers from the rich database (~1800 patients) and assign a leader(s) for each paper, given that all topics cannot be covered in one paper. Multiple papers will ensure the data is manageable and won't overwhelm reviewers.
    - *Paper #1 - NAT Protocol Variation:* Ready for submission to JPO. Everyone should review if they haven't done so already.
    - *Paper #2 - Prevalence and Epidemiology:* Focuses on who was screened, total numbers, and regional variation in screening. The paper will explore reasons for this variation and is not expected to be controversial.
    - *Paper #3 - Risk Factors for NAT Screening:* This paper will address sensitive issues like the influence of race on screening. A predictive model based on age, mechanism of injury, and ADI (Area Deprivation Index) for screening will be developed.
    - *Paper #4 - Predicting NAT Diagnosis:* Focus on factors that predict NAT diagnosis. A strong predictive model will be created, showing that, for instance, children under 18 months with femur fractures have nearly double the risk of NAT compared to those over 18 months.
    - *Paper #5 - Non-NAT Femur Fracture Treatment Variation:* Examines treatment variation, fracture patterns, and treatment settings (OR vs ER). Despite the lack of outcome data, this paper is publishable, even in lower-impact journals.
- Suggested Journals: Shore mentioned that JOT and JPO are likely options for many papers, with JBJS as a potential journal for the prevalence paper.

Take-Home Points:

- Anyone interested in leading papers #3, #4, or #5 should reach out to Shore. Rosenfeld will be added as an author on all papers, although he does not have a strong preference on who leads the paper.
- First, submit the NAT protocol variation paper. Follow it with the prevalence paper. Then decide whether to merge or separate the risk factors paper (#3) from the diagnosis risk factors paper (#4).
- Lastly, publish the femur fracture treatment variation paper (#5), which can be submitted once paper #2 is published.
- The BCH team will share the data dictionary with anyone interested so that they can choose the relevant variables for each paper.

2:00 PM to 2:20 PM: Gloat Fest

2:00 PM: Differentiating Between Knee Septic Arthritis. Presenter(s): Li

- Our paper was recently published in JPO, differentiating between knee septic arthritis and Lyme arthritis in children. The results have been presented on multiple occasions, so only a brief summary was provided.
- This presentation focuses on the experience with the submission process and the strategy used to ensure that all contributors to the MSK Infection Database were properly recognized as collaborators and named authors.
- At the outset, the group initially intended to publish under the name CORTICES alone in the byline. However, given that certain individuals contributed more significantly to specific projects, it was decided to list those individuals as authors, with CORTICES as the last author. Additionally, those collaborators who contributed patients would be included in the CORTICES study group as searchable authors.
- However, ensuring this recognition has been challenging, often requiring communication with the journal after the paper has been indexed in PubMed.
- In this publication, the title page begins with the usual information, and the second page lists all collaborators who helped build the MSKI database. It was explicitly stated that these members should be included as searchable authors in PubMed after publication. Unfortunately, this step alone has not always been sufficient, as seen with a previous paper on the descriptive epidemiology of upper extremity septic arthritis, which did not result in the inclusion of collaborators as searchable authors.
- To address this, an additional comment was included in the free text box for submissions, specifically requesting the inclusion of all authors in PubMed. However, even this approach has not always guaranteed success.
- The key lesson is that the corresponding author must carefully monitor all aspects of the submission, thoroughly review the proofs, and, if necessary, contact the assigned editor to ensure that the paper is published with the desired author acknowledgments.

Take-Home Point:

- **Shore:** A reminder for corresponding authors—it's your responsibility to make sure everything looks right in the title page and proofs and that your colleagues get the credit they deserve for their work.

2:10 PM: Management of Syndesmotic Injuries in Children Presenter: May

- The survey study that was initially completed by the group and presented at POSNA a few years ago has recently been published. A brief summary of the findings was shared during the presentation.

2:30 PM to 3:00 PM: By-Laws Discussion and Committees (Cont.)

2:30 PM: IMPACCT Meeting Updates

- May and Truong shared the main take aways of the IMPACCT group meeting as they are CORTICES representatives in that group and we want to ensure collaboration but make sure we don't have duplication of ideas.
- The presentation and discussion focused on updates about two ongoing RCTs (COMET and DRIFT), challenges faced during recruitment, and differences in healthcare systems that impact trial participation. The discussion also highlighted cultural biases toward surgical treatments in North America and contrasts these with the UK and Canada, where healthcare systems are more conducive to such trials. Participants emphasized the importance of educating referral centers to avoid biases and improve recruitment. They also discussed strategies for handling challenges, such as low enrollment, site-specific processes, and the complexities of randomized trials.

2: 45 PM By-Laws Updates. Presenter: Shore

- The discussion led by Shore centers around proposed updates to the bylaws of CORTICES, particularly regarding terms and roles of the Board of Directors and other positions.
- The organization's bylaws had been somewhat stagnant, leading to confusion over roles like President, Secretary, and Treasurer. The goal is to create a clearer structure and define responsibilities.
- The group is proposing three-year terms for board members, with a maximum of two consecutive terms. To ensure continuity, they plan to stagger rotations, allowing some board members to remain while others are rotated out. This would prevent all members from leaving at the same time and ensure institutional memory is preserved.
- The current BOD structure evolved out of necessity rather than exclusivity, and there is a desire to encourage broader participation from newer members. This includes mentoring and providing leadership experience.
- There is discussion around maintaining a leadership role for someone from BCH, given the resources BCH contributes to the group, particularly for research and infrastructure.

- The group is considering whether roles like Secretary and Treasurer are necessary. There is also mention of the need for marketing and website expertise to improve the group's online and educational presence, as their social media activity has been minimal.
- The next step is to draft proposed changes to the bylaws and present them for a vote among members. The goal is to balance maintaining institutional memory with allowing new people to take on leadership roles.

3:00 PM: Meeting Adjourned for the Day

Saturday September 28th

8:30 AM to 9:00 AM: Infection Grant: Presenter: Schoenecker

- The focus is on a 10-year plan to explore injury, morbidity, and mortality and develop predictive algorithms.
- Step 1.2 (2024-2026): Preparing for POSNA and February grants to prove IRB approval and blood sample collection capabilities.
- Step 3 (2026-2028): Build a robust population database and create predictive models, leveraging the EPIC system.
- Step 4: Test the predictive model using newly collected data.
- Step 5 (2029): Use the model to guide disease treatment strategies.
- It is observed that children who die often suffer from multiorgan dysfunction syndrome (MODS) driven by immunocoagulopathy, immunothrombosis, and neutrophil damage.
- The cohort will consist of children with severe infections as cases and patients with cerebral palsy (CP) as the control group.
- Data collection will focus on CMP (Comprehensive Metabolic Panel) and CBC (Complete Blood Count) with differential counts.
- Initial steps (1-4) are primarily observational to establish data and avoid changes in clinical practice at this stage.
- CORTICES members should consult their teams on how they stratify risky CP patients at their institutions to understand what are the variables that the group most commonly collects.
- Consensus is needed on which variables to collect and how to gather data (Steps 1 and 2).

- Data will be recorded without the need for immediate control, using DAMP (Damage-Associated Molecular Patterns) as a monitoring tool for children.
- Interventions may include surgical procedures, not just drugs.
- The planning grant will focus on obtaining IRB approval and refining population and variable selection, with oxygen requirement signals as an early MODS indicator.
- Complex care and infectious disease experts will be engaged to identify critical variables.
- The initial phase aims to gather data from 100-200 children, including CP and infection patients, to build the database.
- Validation of the model may involve animal models, with testing in both healthy children and CP patients over time.
- Insights from COVID, particularly the role of neutrophils in clinical deterioration, will inform parts of the study. TXA (Tranexamic Acid) use beyond surgery may be explored.
- A prospective IRB grant will target both elective and severe infection cases, focusing on CP and non-CP patients for long-term study.

Take Home Points:

- Shore urged members to engage their complex care teams in discussions about the pathophysiology.
- Members asked that Schoenecker sends the intended labs to compare with current institutional practices.
- Schoenecker encouraged participants to think not only about variables but also about available resources, particularly from infectious disease and complex care teams.
- Members were advised to identify potential collaborators at their institutions, even if no immediate outcomes emerge, as this can initiate valuable dialogue.
- For those less involved with CP surgery, Shore recommended speaking with colleagues to better understand risk evaluation and patient outcomes, especially regarding ICU admissions and clinical deterioration.

9:00 AM to 10:00 AM: New Studies

9:00AM: Traumatic Arthrotomy. Presenter: Livingston

Study Summary:

- There is Inconsistent treatment of traumatic arthrotomy, driven by belief rather than evidence. Limited literature on infection risks, especially in children.

- BCH study identified 37 cases over 20 years, low sample due to lack of specific ICD or CPT codes.
- Results showed no deep infections or septic arthritis; 2 cases of superficial infection treated with antibiotics.
- Most injuries involved the knee; no clear infection risk factors identified.
- Study limited by small sample size and single-institution data.
- Further research, including a multicenter study or surgeon survey, is needed to clarify treatment urgency and antibiotic use.

Comments:

- Inclusion of gun violence cases was debated, but if included, it may need to be analyzed separately due to different treatment considerations.
- Some patients were treated with antibiotics for several days post-injury, raising interest in further discussion on this practice.
- Livingston suggested use of natural language processing (NLP), CT scan reports, and operative reports to find relevant cases. However, centers' capabilities for data extraction may vary.
- Emphasized that physical exams often diagnose traumatic arthrotomies, though CT scans are useful. Defining when joint challenges are needed is another topic for exploration.
- Some mechanisms (e.g., gunshot wounds, animal bites) might warrant separate analyses due to different infection risks. Penetrating biological injuries, such as tree branches or ATV accidents, may increase infection risk.
- Many institutions have established CT protocols, but these may only detect occult cases, missing others diagnosed through physical exams.
- Some patients might be overtreated with antibiotics, and more research could help identify when antibiotic use is necessary.
- Geographic variability in injury mechanisms (e.g., branches in rural areas) might affect the injury patterns studied.
- Limited case numbers over 20 years raise concerns about adequately assessing prevalence, though even a small cohort could provide valuable insights.

Take Home Points:

- Start by surveying CORTICES members to capture variability in treatment approaches. This will highlight areas needing consensus and inform the key variables for the retrospective study.
- Pay special attention to different mechanisms of injury (e.g., gunshot wounds, animal bites, biological penetrations) and how geographic differences might influence injury patterns and treatment protocols.

- Investigate the variability in antibiotic administration, particularly whether certain injuries are more likely to receive antibiotic treatment, and explore potential overuse of antibiotics in non-severe cases.
- Consider including questions in the survey about the mechanisms each institution uses (e.g., CT scan reports, operative notes, NLP) to identify patients in the notes when specific diagnostic codes are not available. This will help standardize the approach for retrospective data collection across sites.

9:30AM: Hip Dislocation (Virtual) Presenter: Baldwin
Study Summary:

- This topic has been discussed since the very first CORTICES meeting and is highly relevant due to its rarity and clinical complexity.
- Traumatic hip dislocations are rare but high-stakes injuries with many associated complications (e.g., avascular necrosis [AVN], associated fractures). Clinical management is often unclear due to limited cases per institution, small sample sizes in the literature, and incomplete data.
- Current literature only offers small studies (30-50 patients per study) with inconsistent findings, particularly in terms of risk factors for AVN. Only time to reduction has been consistently linked to AVN risk. Other factors such as BMI, skeletal maturity, and post-op protocols (e.g., bracing, weight-bearing) have not been thoroughly evaluated.
- Objectives of the Retrospective Study:
    - Establish differences in clinical management across institutions.
    - Determine the incidence of fractures, adverse events, and outcomes (e.g., AVN).
    - Investigate factors affecting outcomes, including timing, location of treatment, and imaging protocols.
    - Develop a traumatic hip dislocations classification system like the "floating elbow" classification.
    - Identify risk factors for complications like AVN, and explore mechanisms of injury and dislocation direction patterns.
- Study Design and Timeline:
    - Inclusion criteria: Patients aged 0-18 years with hip dislocations, with at least 3 months follow-up.
    - Exclusion criteria: Congenital dislocations, patients with cerebral palsy.
    - Aim to finalize sites and set up REDCap by December 2024, followed by data collection over the next 1.5 years.

- Timeline for results: Initial analysis and papers expected by late 2026, with publication targets for JBJS or JPO.

Comments

- There was a suggestion to involve someone deeply invested in hip surgery, recognizing the importance of having relevant experts on the team to bring ideas that might otherwise be overlooked.
- Discussion revolved around the importance of skeletal maturity in data collection. A modified Oxford scale was suggested for use, as it is easy to perform and already in use in similar projects. Some participants noted that many patients had post-reduction CT scans, which could provide useful data.
- The CHOP group generally appreciated the feedback received by the research committee. Concerns were raised that some centers might not have the necessary data or resources, but there was agreement on including as much data as possible from a subset of patients to avoid missing out on key findings later.
- The audience agreed that sharing data dictionaries would help identify if there is anything else that needs to be added. There was a plan to set a deadline for feedback to avoid delays in moving forward.
- There was a suggestion to have centers explicitly commit to participation and designate a point person to ensure accountability and data collection. This was considered important given the amount of data needed for the study.

Take Home Points:

- The goal for the study is to produce multiple papers addressing different aspects of traumatic hip dislocations, ensuring the data collected is used efficiently for various research questions.
- Each participating center that wants to participate should commit to the study by assigning a dedicated point person PI and research assistant responsible for data collection. This will enhance accountability and ensure smooth collaboration across multiple sites given the broad scope.
- Baldwin to share data dictionary across centers early to allow for valuable feedback, ensuring that all necessary data points are captured before data collection starts.

10:00AM to 10:50 AM: Napkin Ideas (Each 10 min)

10:00AM: SH 2 distal tibia Consensus study. Presenter: Swarup

- **Objective:** Investigate Salter Harris Type 2 distal tibia fractures using a modified Delphi approach, based on surgeon intuition and experience, to address areas of clinical uncertainty.
- **Background:** Given the variability in how physeal closure is assessed and the complexity of conducting large-scale prospective studies, a consensus-based approach may be more feasible now.
- **Methodology:** Form a core group of surgeons to review existing literature and participate in iterative surveys to identify areas of controversy and consensus. Discussions would follow after the second or third round of surveys to further refine consensus.
- **Next Steps:** Recruit a group of 5-10 committed surgeons to begin the modified Delphi process, which will help establish agreement or highlight areas lacking consensus. This work could inform future prospective studies by identifying key factors to investigate.
- Volunteers: Schoenecker, Riccio, Denning, Livingston, Souder, Sanders, Blumberg, Mcgraw Heinrich, Owens, Matt Stepanovich, Laine.

10:10AM Complication of Septic Arthritis of the Hip. Presenter: Sanders

- **Objective**: Leverage the existing MSKI database to determine the rate of AVN following septic arthritis in any joint and potentially identify associated risk factors.
- **Background**: Current literature reports a broad range of AVN rates (8-28%) but is based on limited case series.
- **Next Steps**: Conduct a power analysis to assess the available sample size. Based on Shore's paper on secondary procedures, there were approximately 26 cases of AVN, so initiating a data query is feasible. The level of detail in analyzing AVN cases can be decided later, as this represents a straightforward opportunity for investigation.

PS: *Survey paper about pelvic fractures was just accepted to JPO.

10:20AM: Calcaneal Fractures-Presenter: May

- **Objective**: Assess the incidence, fracture patterns, and outcomes of calcaneal fractures in children, comparing operative vs. non-operative treatments.
- **Background**: Pediatric calcaneal fractures are rare, and current treatment guidelines are based on adult data. There's limited research on pediatric-specific outcomes, classification systems, and treatment approaches.

- **Methods**: Retrospective analysis of pediatric calcaneal fractures over 10 years, comparing fracture patterns, treatment modalities, and outcomes between operative and non-operative groups.
- **Next Steps**: Develop a research proposal, submit for institutional approval, build a REDCap database, and present refined plans at the next meeting.

10:30AM: MRI in setting of a hip effusion: standard of care or unnecessary cost- Presenter: Blumberg

- **Objective:** To investigate whether MRIs are necessary in the diagnostic and treatment pathway for septic arthritis, particularly in cases where alternative diagnostic tools like ultrasound show effusions, and labs provide inconsistent results.
- **Background:** Some studies show that MRIs alter treatment in up to 60% of cases, but the necessity and added value of MRI before surgery are still debated.
- **Discussion:** Discussion and evaluation of the current use of MRIs in septic arthritis cases at multiple institutions, analyzing their impact on diagnosis, surgical decision-making, and patient outcomes.
- **Next steps:** Refine the study idea and the intended purpose. Explore if this is better as a survey and maybe what is needed is a "Current Concepts" paper.

10:40AM: Trauma management projects- Presenter: Jessica McGraw-Heinrich

- **Institutional Trauma Practices**: McGraw-Heinrich is exploring how different institutions handle trauma, noting that some places have dedicated trauma teams or rooms, while others don't. She's interested in understanding the broader landscape, including how cold trauma (i.e., delayed trauma care) is managed.
- **Dedicated Adolescent Trauma Rooms**: McGraw-Heinrich mentioned investigating how adolescent trauma is treated in facilities with dedicated trauma rooms, with a focus on resource utilization and acute ER management.
- **Pediatric Pelvic Fracture Management**: McGraw-Heinrich discussed pediatric pelvic fractures, considering whether existing adult algorithms for unstable pelvic injuries could be applied or if pediatric-specific algorithms are necessary. The focus includes institutional practices for treating these fractures and whether cases are transferred to other institutions for care. Julia Sanders to share a related paper that alluded to pelvic fractures.
- **Surgeon Preferences for Femoral Fracture IMN Fixation**: McGraw-Heinrich touched on surgeon preferences regarding intramedullary nailing (IMN) for femoral fractures in adolescents, including variations in the practice, differences in

diagnosis, and specific techniques like retrograde nailing and the use of Buck's traction.

- **Next step:** develop a research proposal that has not been done and discuss with potential collaborators.

10:50 AM to 11:10 AM: Finances

Company External Funding Updates- Presenter(s): Shore

- **Funding Structure**: There is ongoing confusion about how to structure the flow of funds from OP. Baldwin was going to work with OO to develop a pediatric plate, but he has not signed a contract. The funds need to be directed either to him personally or through an organization, but the tax implications are unclear. There is also concern about compliance with legal regulations such as the anti-kickback law.
- **Tax and Legal Concerns**: Spence said that the easier possibility is for Baldwin to receive funds directly from OP and then donate them to the Boston Children's Orthopedic Foundation. However, this method would result in after-tax funds, which would diminish the overall value of the donation. Baldwin is advised to consult a lawyer to ensure that the transaction structure complies with legal requirements.
- **Funding Agreements**: A contract with OP for $15,000 per year has been established for educational purposes, and OP does not have an issue with this setup. The group considers structuring future funding similarly.
- **Future Financial Needs**: The group discusses the potential use of future funds, including the possibility of hiring a statistician, funding a dedicated research team, or supporting organizational overhead. There is concern about Boston Children's Hospital's budgetary constraints, which could affect future funding and research efforts.
- **External Funding**: The group's current external funding sources are limited, and they are exploring opportunities to secure additional funding as the collaboration grows.
- **Contractual Actions:** Spence suggested that Baldwin speaks with OP about the contract to structure future funding in a way that directs funds to the organization rather than to him personally. Additionally, Shore plans to reach out to COSF to ensure compliance with regulations.

11:10 AM to 11:30 AM: Miscellaneous

Merch:

- The group agreed to have merch for next time we meet. Either a Hoodie or 1/4-Zip Sweatshirt.
- Upasani to lead the search for suggestions and send it to Shore.
- Shore has a contact with a manufacturer and another at L.L. Bean.
- The group will have to chime in a portion of the cost and the rest to be paid with CORTICES funds.

Spence working with a POSNA committee on Firearm Injuries

- POSNA is interested in investigating the impact of firearm injuries on children. Spence wanted to ask the CORTICES members if they are ok if he discusses potential collaborations with the CORTICES study group. While he is unsure of the request, he wants to ensure that the group is supportive of exploring this topic.
- The group agreed that firearm injuries are a critical issue and expressed interest in hearing from Spence once he has more concrete requests.
- For now, the group was asked to return to their institutions and gather information to help understand the impact of firearm injuries at their hospitals. Specifically, members were asked to reach out to the person responsible for Trauma registries at their institution to obtain the following data:
    - The total number of cases coded as firearm injuries over the last 5 years, and
    - Of those, how many have orthopedic related injuries and required care by an orthopedic surgeon.

Annual Meeting:

- The group agreed that the Annual Meeting should be held ideally Mid-September to make sure we have a chance to present ideas that will be submitted to POSNA (deadline Oct 1st) and ensure that projects receive appropriate feedback and we have strong papers representing the CORTICES group.
- Walter Truong volunteered Minnesota to be the 2025 host of the Annual CORTICES Meeting. Dates TBD.