I. Analyzing the Problem

Adjacent joint failure, in 2015, has many forms. Some patients have had relatively recent reconstructive procedures that involve arthrodesis for adult flat foot or other deformities. Others have had distant arthrodesis procedures performed and have now developed adjacent joint arthritis. While poliomyelitis has been eradicated in this country since 1954, many of these affected individuals who had a distant reconstructive procedure are now seeking our expertise for residual pain, and occasionally deformity. Still others have had procedures that involve fusion for post traumatic, inflammatory, or osteoarthritis. In short, this is a very diverse group of individuals that require a broad, comprehensive, and thoughtful evaluation of their problem. In initially approaching these patients, the following questions are worth asking:

1. Could this be neuropathic?
   a. This is often idiopathic, subtle and may be undiagnosed
2. Why were the original fusions done?
   a. Idiopathic arthritis
   b. Post-traumatic, (other soft tissue injuries?)
   c. As part of deformity correction?
   d. Combination of all of these
3. Did the first fusion(s) incorporate some deformity correction? What was it?
4. Is there residual deformity?
5. Was there adjacent joint arthritis evident at the time of the last fusion?
6. Is the current arthropathy associated with deformity?
   a. is the deformity compensatory
   b. fixed or flexible
   c. is there muscle imbalance and/or soft tissue contracture
7. Is there bone loss?
8. Do significant comorbidities exist?
   a. Neuropathy
   b. Peripheral vascular occlusive disease
   c. Factors that would affect wound or osseous healing?
9. Is there an overall limb malalignment?
a. Seldom are deformities uniplanar so that when fusions are performed it is even more difficult to predict resultant deformity

II. Common Associations
1. Midfoot arthritis and deformity with or without previous hindfoot fusion is usually accompanied by (caused by) Achilles or gastrocnemius tightness
2. A change in coronal alignment as part of an hindfoot arthrodesis is often associated with a resultant (often symptomatic) midfoot or forefoot coronal deformity (a common example is forefoot supination after lateral column lengthening)
3. Ankle fusions are commonly associated with eventual subtalar arthritis
4. Malpositioned subtalar or triple arthrodesis will lead to ankle malalignment and accelerated arthritis

III. Making a Plan
A. Goals
   1. Painless joint
   2. Well-aligned plantigrade foot
B. Evaluation
   1. Clinically, in addition to more common physical examination considerations, it is imperative to understand soft tissue deforming forces (muscle imbalance and/or soft tissue contracture), flexibility of the deformity, and local (what does the foot look like on WB) as well as overall limb alignment. Don’t forget rotational malalignment of the leg as this is often a contributor
   2. Imaging
      a. Plain, WB XR
      b. Usually a hindfoot alignment view if there is any primary or compensatory hindfoot deformity or pain
      c. CT can be helpful in recognizing adjacent joint problems in joint that are sometimes difficult to image (intercuneiform or subtalar). It is also helpful in that it can evaluate the previous fusion mass for position and osseous union. Finally, if deformity correction is part of the plan, a CT can help plan osteotomies and hardware (diagnostic injections also helpful)
C. Comprehensive understanding
   As any plan is finalized, make sure you take into consideration these factors:
   1. Will you need to combine the fusion with an osteotomy, or get deformity correction with fusion alone?
2. What soft tissue balancing is necessary?
3. Will you need to take down the previous fusion?
4. What will you do to mitigate any biomechanical consequences?

IV. References
