

Session: V

Session Title: Infection: The Unsolved Problem in Hip and Knee Arthroplasty... Can We Focus Technology and Innovation to Make a Difference?

Session Type: Symposium

Location: South, Room 210

Date & Time: 02-14-2024, 11:00 am - 12:30 pm

INSTRUCTORS WHO CONTRIBUTED TO THIS HANDOUT: as of 1/9/2024

Moderator(s):

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Faculty:

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**Infection: The Unsolved Problem in Hip & Knee Arthroplasty...
Can We Focus Technology and Innovation to Make a Difference?**

Symposium V
Wednesday, February 14, 2024
11:00am – 12:30pm

Rationale and Why We Need Innovation for Infection

Daniel J. Berry, M.D.
Mayo Clinic
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I. Why is This Symposium So Timely and So Important?

- A. Infection is our single biggest unsolved problem in THA and TKA
 - 1. The rate of infection in primary THA and TKA is roughly the same nationwide as in 1990.
 - 2. The rate of success of treating PJI is also roughly unchanged in that same time period.
 - 3. And this despite a lot of expensive and time intensive efforts.
 - a. Patient optimization
 - b. Staph screening and decolonization
 - c. Lavages
 - d. Spacers
 - e. New antibiotic treatments
 - f. Etc., etc., etc.
 - g. One can make the case that most of these efforts have had little impact
- B. And equally bad...treatment of most PJI's relies on barbaric, archaic methods:
 - 1. Removal of well-fixed, otherwise well-functioning implants by tearing them out of the bone.
 - a. This is associated with notable morbidity (and mortality!) whether done in one or two stages.

II. We Need Real Game Changers

- A. Prevent bacterial colonization of prostheses.
- B. Accurately identify infection when present.
- C. Get rid of established bacterial infection of implants without getting rid of the implant (if possible!).

III. This Symposium:

- A. Will review state of the art.
- B. Will update you on advances.
- C. Will provide all of us a chance to:
 - 1. Identify unsolved problems
 - 2. Consider innovative methods to solve these unsolved problems

Infection: The Unsolved Problem in Hip and Knee Arthroplasty... Can We Focus Technology and Innovation to Make a Difference?

Moderator: Dan Berry

Faculty: Mike Bolognesi, Thorsten Seyler, Gina Suh, Javad Parvizi

Rationale and Why we Need Innovation for Infection: Dan Berry (5 minutes)

Innovation in Prevention and Diagnostics: Robin Patel (7 minutes)

Antibiotics and Phage Therapy: Ken Urish (7 minutes)

Genome, Microbiome Manipulation and Beyond!: Javad Parvizi (7 minutes)

Implant Sided Solutions for Infection: Thorsten Seyler (7 minutes)

Optimized Techniques for Implant Removal: Michael Bolognesi (7 minutes)

Antibiotics and Phage Therapy:

Kenneth Urish MD PhD (7 minutes)

Problem:

- Current treatments have less than satisfying outcomes
- Note: This is very brief (~20s) as covered by Dan Berry

Two Objectives:

Limitations of current antibiotics and possible solutions in FDA clinical studies

1. Understand limitations with current antibiotics (basic science mechanism)
 - a. Clinical: Similarities between PJI and Oncology
 - b. Basic Science: Biofilm Antibiotic Tolerance
2. Current New Approaches in FDA Clinical Studies
 - a. Acute Infections: DAIR: PLG0206; FDA Phase 2
 - i. Rationale
 - ii. Mechanism
 - iii. Reported Efficacy vs Risk Profile
 - b. Chronic Infections: Two Stage: Apex-2: Rapid Two stage Exchange with continuous antibiotic I&D; FDA Phase 3
 - i. Rationale
 - ii. Mechanism
 - iii. Reported Efficacy vs Risk Profile
 - c. Salvage: Bacteriophage; APT; FDA Phase 2
 - i. Rationale
 - ii. Mechanism
 - iii. Reported Efficacy vs Risk Profile