Planning Session for Overcoming Gaps
What further research understanding is required in the next 1 – 5 years?

- PRC physiology has not been translated into dynamic light standards
- Night shift impacts of dynamic lighting
- Metrics to measure emotional impact of lighting
- Differences of patient types vs. staff (in situ research)
- PRC impacts during nighttime needs more research, significant body of evidence for daytime could lead towards baseline daytime standards
  - Definition/cognizance of individual’s “day” (environmental is different than biological, and is different per person)
  - Balance of risk
- Economic impact understanding and models
- Need well controlled clinical trials (> 100 individuals) beyond current pilot studies
- Personalized lighting in individual healthcare room
How can we work together holistically as researchers and standards organizations to drive and introduce new lighting systems standards?

- IES subcommittee formation for healthcare economic impact
- Opportunity to develop more robust design guideline
- Need connection between lighting designers for research studies to facilities (operators)
- Possibility of ASHE having funds available for research in installations
- CAUTION: Definition of health and well-being very broad
Question 3

How do we educate the broader field on the opportunities in the new lighting capabilities for human health and well-being?

• Develop list of established dynamic lighting testbeds in healthcare facilities in which research can occur for circadian lighting
  • Organization to assist with IRB and facilitation of research protocols
Question 4

Do the necessary lighting/control systems exist?

If not, what needs to happen to get the lighting companies interested in making them?

- Existing controls are too complex to be used by normal people
- No generally analogous to music lighting control
- Available but challenging and complicated
- Option: color set by programmed time clock, user only have control of intensity
- Control complicated from specification point
- Suggestion: time clock integrated into fixture so color changes automatically but then user/designer would have control of intensity (which they are used to)
- Compatibility across manufacturers – need interoperability (DALI may be option…..) BARRIER to simplified operation
- Simple controls available, feedback loops, etc. not necessarily available
Question 5

What kind of ROI metrics make this attractive to healthcare?

- Economic (non-energy) ROI (i.e., length of stay, patient satisfaction, insurance, employee satisfaction/retention) further research being addressed
- Cause vs correlation – circadian disruption on various disease (i.e. cancer)
- Carefully define “light at night” vs shift work
  - Research gap: dose/exposure at night in regular society (not shift work) to cause physiologic effects
  - Research gap: dose of light exposure for shift work environment to build understanding
- Benefits of circadian entrainment tie to sleep disruption
  - Tough to discern between sleep disruption, circadian disruption, melatonin suppression
What else can be done (more futuristic concepts – lighting based actigraphy, asset tracking, interfaces to EMR, other)?

- Wayfinding in healthcare facilities
- Patient engagement (control of their environment)
- Geo-fencing: navigation and localization for patients & staff
- Lighting therapy to reduce drug use
- Asset tracking (RFID elimination)
- Lighting as a service (software defined) providing more value than just energy savings
- UV for disinfection (with embedded sensors for on/off)
- Veterinary hospital lighting impacts on patient recovery
  - Pet care at home for pet “well-being” and circadian disruption
  - Every species has a PRC
Question 7

What can we most effectively do in the next 6 months to a year as a community of industries, industry associations, researchers and research centers to actively pursue more R&D funding for this field?

Which entities do we pursue first? What actions are you willing to take to assist with this?

• ASHE, FGI, Joint Commission, ACHE, AMA, get white paper in front of these organizations
• Webinars and evidence based open journals
• American College of Healthcare Architects (Foundation)
• Defense Health Agency (military base hospitals – revamping)
• Current DoE FOA – Physiological Responses to light
• GSA
• National Institute of Building Sciences (low vision committee & division specific to healthcare facilities)
• American Healthcare Association, SAGE, Leading Age (non-profit), CMMS
• AARP
• IEW, IT/Telecom
• ASID, IALD, AIA, Nursing Institute of Healthcare Design
Need Common reporting mechanism to be agreed upon to be able to compare/contrast studies

Center for Advanced Design published a glossary a few years ago

IES RP29 also defined terms

Action item: IES compare 2 sets of definitions (glossary & RP29)

Challenge: knowing the need for the lighting designers early in the design process to be integrated in the proposal & budget

Enlist ophthalmologists & optometrists, would be great advocating community
Major message takeaways

- Modern life is too much in twilight, need to bring back brighter days and darker nights
- Need increased awareness
- Light is essential to human life forms, primary synchronizer (light irrespective of its source)
EDUCATION

• Online education (Khan Academy, MOOC)
• Need to step back and assess what are we going to educate the public about, have to be careful of core substance of message
ACTIONS
Martin – PRC
Bud/Naomi – Common reporting mechanisms
Shadab – Summary Pilot studies
Ellen, et al. – ROI Economics

WHITE PAPER
• Comprehensive list of opportunities in healthcare & outcomes
  • SSL-erate (peer reviewed through 2014)
  • RPI action – (peer reviewed 2014 – current)
  • Need summary of case studies
  • CIE published in June 2016 (chair: Jennifer Veitch)
• Barriers to achieving progress
• Actions to allow overcoming barriers (Roadmap)