Collecting and Translating Incident and Injury Data in the Horseracing Industry

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Statement of the Problem

There are no uniform mechanisms or systems to capture the underlying causes of incidents and injuries in the horse racing industry for either human or equine participants.

Only two jockey injury studies pertaining to US horse racing appear in the literature. (Press et al, 1995; Waller et al, 2000) Although both have scientific limitations, both teams of investigators recommended the establishment of a nationalized surveillance system.

According to Powell (2000) regarding sports injury surveillance, “The quality of the available data and its utility in decision-making is based on the breadth and depth of the data collection process.”
Background

Factors Affecting Surveillance

- Each racing corporation is autonomous
- There is skepticism within the industry about collaborating and sharing this information
- State Racing Boards oversee the industry in their respective jurisdictions
- There is no national jurisdiction, e.g., Canadian system, with authority to impose standard practices
Existing national databases, e.g. Bureau of Labor Statistics and state EMT data are insufficient to capture incident and injury data and to develop relevant interventions for either humans or horses

Racing industry injuries are generally excluded from state agricultural injury databases

Data currently collected by individual racetracks is not uniform, may be inconsistent, and is not amenable to statistical analysis and modeling
Accidents and injuries are multi-factorial ...
There is a relationship between the well-being of human and horse...

Since the relationship between horse and human is symbiotic, actions and conditions of one species affects the other...

For a full understanding of accidents and injuries, collection and analysis of both horse and human data is expected to contribute to insights and improved safety.
U.S. Counties with Horse Racing Facilities
Recent Work Pertaining to Human Health and Safety in Horse Racing

indicates specific to Incident and Injury Surveillance

Grants:
Determining Health Status and Health Disparities for an Embedded Rural Workforce, 2005-7, PI-Opacich, KJ, Co-PI-Lizer, S.
Project EXPORT/National Center for Rural Health Professions
Grant No. 5 P20 MD000524-03, NCMHD-NIH

Publications:
Opacich, K.J., Lizer, S., Goetsch, P. (in press) Forging an academic partnership to address health related needs: Targeting embedded rural communities in the horseracing industry, In N. Pollard, F. Kronenbery, & D. Sakellariou (Eds.), Political Practice in Occupational Therapy, Elsevier.
Publications continued...


Presentations:


*Building Enthusiasm for an Accident and Injury Surveillance System in Horseracing*, (Panel on Jockey Injuries) Association of Racing International Racing Commissioners [ARCI], April 2006

Presentations continued...


Presenters: Mary Scollay, DVM and Karin Opacich, PhD


Formulation of Research Advisory Board

Dan Fick, Executive Director & Executive Vice-President, Jockey Club

Peggy Goetsch, MS, Executive Director, Racing Industry Charitable Foundation, Inc. & President, Winners Federation, Inc.

Wayne MacIlwraith, BVSc, PhD, DSc, FRCVS, Diplomate ACVS, Director of Orthopaedic Research, Colorado State University
Michael (Mick) Peterson, PhD, Professor and Graduate Coordinator, Mechanical Engineering, University of Maine

Richard (Chip) Petrea, PhD, University of Illinois-Champaign-Urbana, Illinois Network for Agricultural Safety and Health

Mary Scollay, DVM, Regulatory Veterinarian at Calder Racecourse, FL, and author of the equine injury report form
Specific Objectives:

1. To access and compare epidemiological data for human injury for a comparable time period before and after installation of synthetic track surface.

2. To field test and refine the utility of an on-track injury surveillance system for capturing human and equine data that can potentially be applied nationally throughout the industry.

3. To explore relationships among human attributes, track infrastructure, equine attributes, and industry practices and their relative contributions to incidents and human injuries.
4. To determine if using the on-track recording system for humans and horses yields information superior to existing methods for the purpose of injury prevention.

5. To use resultant scientific data to inform decision-making and risk management to improve health and safety of human participants in horseracing.
Proposed Research Strategies

- For tracks with synthetic surfaces, compare pre and post installation injury data in whatever form that exists for comparable meets/racing days
- Code the on-track forms for analysis
- Identify and train a cadre of human injury data collectors
- Field test the utility of the human on-track injury report form
- Link human data with equine data generated from the on-track equine report via data managers
- De-identify and forward data to PI
- Perform statistical analysis, e.g. frequencies, correlations, factor analysis, step-wise regression analysis
- Interpret data with assistance from the Advisory Committee; proposed additional analyses toward generating a logistical regression model
- Compare the information yielded from the On-Track reports to the nature and quality of existing data
Development of Surveillance Tool Design informed by...

Biddle and Marsh (2002)
- Nature of injury/illness
- Part of the body affected
- Source of injury/illness
- Event or exposure
- Secondary source of injury/illness

- Core minimum data
- Core optional data
- Supplementary data
## Equine Injury Report Form

**Developed by Mary Scollay, DVM**

**Tracks Currently Committed to Equine Pilot**

<table>
<thead>
<tr>
<th>Left Column</th>
<th>Right Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque Downs</td>
<td>Hawthorne Racecourse</td>
</tr>
<tr>
<td>Arlington Park</td>
<td>Hoosier Park</td>
</tr>
<tr>
<td>Aqueduct</td>
<td>Lone Star Park</td>
</tr>
<tr>
<td>Belmont Park</td>
<td>The Meadowlands</td>
</tr>
<tr>
<td>Beulah Park</td>
<td>Monmouth Park</td>
</tr>
<tr>
<td>Calder Race Course</td>
<td>Penn National</td>
</tr>
<tr>
<td>Canterbury Park</td>
<td>Philadelphia Park</td>
</tr>
<tr>
<td>Charlestown Races</td>
<td>Prairie Meadows</td>
</tr>
<tr>
<td>Delaware Park</td>
<td>Saratoga</td>
</tr>
<tr>
<td>Emerald Downs</td>
<td>Suffolk Downs</td>
</tr>
<tr>
<td>The Fairgrounds</td>
<td>Woodbine</td>
</tr>
<tr>
<td>Gulfstream Park</td>
<td>Yavapai</td>
</tr>
<tr>
<td>Indiana Downs</td>
<td>Potentially 10 additional</td>
</tr>
</tbody>
</table>
Process for completing equine form...

- Regulatory veterinarian will complete data for any horse deemed to be observably injured upon post-race examination (average projected to be one/day/track)
- Background data available from daily racing form and/or Jockey Club Information Systems
- Additional instructions accompany form
- Another form being developed for equine injuries during training
- Data will be entered by designated data input specialist
- Unique identifiers, e.g. horse's name, will be removed and only aggregate data reported
<table>
<thead>
<tr>
<th>Surface</th>
<th>Race</th>
<th>Distance</th>
<th>Field Size</th>
<th>Age</th>
<th>Weight carried</th>
<th>Resident Status</th>
<th>Pre-Race Inspection Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirt</td>
<td>Claiming</td>
<td>1 furl</td>
<td>5 f</td>
<td>Final Time (Month)</td>
<td>Post Position</td>
<td>1-1/2 yrs</td>
<td>Skip a</td>
</tr>
<tr>
<td>Synthetic</td>
<td>$5</td>
<td>5 1/4 f</td>
<td>5 f</td>
<td>Placing by</td>
<td>Sex D</td>
<td>Coll Horse</td>
<td>DNF</td>
</tr>
<tr>
<td>Turf</td>
<td>$5</td>
<td>6 f</td>
<td>6 f</td>
<td>Mango</td>
<td>Mile</td>
<td>No change</td>
<td>NA</td>
</tr>
<tr>
<td>Condition</td>
<td>Maiden</td>
<td>Not Listed</td>
<td>Weanling</td>
<td>Open</td>
<td>Mile</td>
<td>Mile</td>
<td>NA</td>
</tr>
<tr>
<td>Fast</td>
<td>7 f</td>
<td>7 1/16 f</td>
<td>7 3/16 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Date</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Muddy</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Slow</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Wet Fast</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Firm</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Soft</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Off Turf</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Off Turf</td>
<td>7 f</td>
<td>7 f</td>
<td>7 f</td>
<td>Top Time</td>
<td>Distance</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

**Equipment**
- Blinkers
- Scoop blinker
- Cornet color
- Ring bit
- Run-out bit
- Bit bur
- Other

**Shoeing**
- Flam Queens Plate
- OXThimble
- R h shoe
- Reg / Ch Toe grab
- Ear shoe
- Date
- Uddernail
- Jer curds
- Glue on shoes
- Blocked heel
- Broke
- Bent shoes
- Rim Pad
- Full Pad
- Spider plate
- Other

**Injury Data**

<table>
<thead>
<tr>
<th>Location</th>
<th>Anatomic Region</th>
<th>Site</th>
<th>Injury Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>D</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**INCIDENT RELATED INFORMATION**

**RACING**
- Last Race: NA
- Equipment Failure: Clips heels
- Clipped heels: Bumped flat Collapsed
- Ducked: Boiled Paled to maintain course
- Impeded: Checked
- Contact with rail / gate / vehicle

**NON-RACING**

**OUTCOME**
- Pre Race: Official Veterinarian Scratch AM
- Post Race: Pasture / returning
- Fastness: Injury other
- Injury Location: X=

**Triage Score**
- Kinetic energy: Compression boot
- Robert Jones Edg
- Ext. stabilization: Other
- NA: Other
- Jockey / rider: Jockey
- SteWARDS ACTION:
  - Shoulder rescue
  - Ambulance
  - Other

**EMERGENCY MEDICATIONS**
- Adrenalin
- Betamethasone
- Dexamethasone
- Xylazine
- Pred. sol. succinate

**Injury**
- Prognosis for return to racing soundness: Excellent
- Good
- Fair
- Poor
- Career ending injury: Not applicable
- Unknown
- Outcome:
  - Non-fatal:
    - Anticipated return to training / racing:
      - < 30 days
      - 31-60 days
      - > 60 days
      - Not applicable
  - Fatally:
    - Euthanized (72 hrs post injury)
    - Died
    - Unknown
<table>
<thead>
<tr>
<th>Limb</th>
<th>Injury Category</th>
<th>Anatomic Region</th>
<th>Site</th>
<th>Injury Modifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF</td>
<td>UNKNOWN</td>
<td>Dorsal limb</td>
<td>Sesamoid-med</td>
<td>Chop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sesamoid-lar</td>
<td>Condylar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sesamoid-basi</td>
<td>Comminuted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MC1/L MT1</td>
<td>Cortical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Carpal bones</td>
<td>Oblique</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fr1/Fr2</td>
<td>Non-displaced</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Plnt-med</td>
<td>Stable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Plnt-lar</td>
<td>Spinal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tarsal bones</td>
<td>Transverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compound</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRACTURE</td>
<td>NON-FRACTURE</td>
<td>Long bone</td>
<td>Humerus</td>
<td>Lateral</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Femur</td>
<td>Dorsal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Radius/Utina</td>
<td>Medial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tibia</td>
<td>Sagittal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ankle skeleton</td>
<td>Plantar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skull / Spine</td>
<td>Promenial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pelvis</td>
<td>Dorsal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Medial-Plantar</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOFT TISSUE</td>
<td>Suspensory</td>
<td>Medical branch</td>
<td>Promenial 1/3</td>
<td>Promenial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lateral branch</td>
<td>Middel 1/3</td>
<td>Promenial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body / Cap</td>
<td>Dorsal 1/3</td>
<td>Promenial Left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check ligament</td>
<td>Patellar</td>
<td>Patellar Rupture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dorsal Sac.</td>
<td></td>
<td>Lacerated/Severed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tendon</td>
<td>SDF</td>
<td>Strain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tendon Sheath</td>
<td>DDF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muscle</td>
<td>CDRT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER-MS</td>
<td>OTHER-MS</td>
<td>Facelock</td>
<td>DJD / OA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carpus</td>
<td>Subluxation / Laxation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interphalangeal</td>
<td>Disarticulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soft</td>
<td>Open / Closed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hook</td>
<td>D/F Instability</td>
<td>Mild</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>M/L Instability</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Severe</td>
</tr>
<tr>
<td>NON-MS</td>
<td>OTHER-MS</td>
<td>Laceration</td>
<td>Run down score</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Puncture</td>
<td>Hematoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>Grabbled 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Foot bruise</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Triage Scoring**

- **0**: No lameness observed on track
- **I**: Grade III or lower lameness; no obvious limb deformity
- **II**: Grade III lameness: no obvious limb deformity
- **III**: Mild to moderate limb instability in 1 plane, closed injury
- **IV**: Severe instability in 1 plane, closed injury
- **V**: Limb instability in 2 or more planes / loss of column of support (open or closed); open: 1 joint capsule/tendon sheath
Definition of an on-track human incident or injury...

- Any event or condition occurring in the paddock area or on the racetrack that results in harm to a licensed horseman performing a job preceding, during, or after a race.
Process for completing human form...

- Paramedics (?) engaged to attend to injuries during racing will be trained to complete the form during the pilot period
- Forms will be completed for both minor and major incidents and injuries
- A neutral third party will obtain follow-up information and link the equine data to the human data
- Unique identifiers will be removed before the data set is forwarded to the researcher for input
- Data will be analyzed and only aggregate data will be reported
### Human Accident and Injury Data

**Indicate Job Category for each person involved in the accident injury:**
- Jockey, Apprentice Jockeyman, Cuer, Pacer, Racer, Groom, Valet, Groomer, Driver

**Indicate age and gender for each person.**

<table>
<thead>
<tr>
<th></th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>M/F</td>
<td>Age</td>
<td>M/F</td>
<td>Age</td>
<td>M/F</td>
</tr>
</tbody>
</table>

**If Job Category is Jockey, indicate weight in pounds.**

|   | Weight | Weight | Weight | Weight | Weight |

**Engaged in pre-race reducing behavior?**
- Yes
- No

**Briefly describe maneuver leading to incident.**

**Was there an objection filed?**
- Yes
- No

**Rule violation? If yes, cite rule.**
- Yes
- No

**Disqualification?**
- Yes
- No

#### Circle Point(s) of Impact and Notate

**Wearing/using person protective equipment?**

- Yes
- No

**Equipment: tack failure?**

- Yes
- No

**Known pre-existing medical condition(s)? e.g., diabetes, visual impairment**

<table>
<thead>
<tr>
<th></th>
<th>helmet</th>
<th>vest</th>
<th>goggles</th>
<th>safety reins</th>
<th>other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>reins</td>
<td>girth</td>
<td>stirrup</td>
<td>saddle</td>
<td>bridle</td>
</tr>
</tbody>
</table>

#### Neurological Indicators

- Conscious
- Alert, lucid
- Non-verbal, uncommunicative
- Demented
- Not conscious

- Nausea or vomiting
- Numbness
- Shaking or shimmery
- Seizure(s)
- Deceased
<table>
<thead>
<tr>
<th>Respiratory Status</th>
<th>breathing normally</th>
<th>labored breathing</th>
<th>not breathing</th>
<th>rapid breathing</th>
<th>obstructed breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity of Pain (1=lowest, 10=highest)</td>
<td>Location:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate Action</td>
<td>CPR</td>
<td>Spinal Cord Precautions</td>
<td>Immobilization of one or more extremities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispensation at Site of Accident/Injury</td>
<td>Resumed work</td>
<td>Ambulatory Care</td>
<td>Urgent Care</td>
<td>Emergency Transport</td>
<td>Morgue</td>
</tr>
<tr>
<td>Suspicion of use of restricted or illegal substance</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission of restricted or illegal substance</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosed Injuries:</td>
<td>Follow-Up Care</td>
<td>Treated and released</td>
<td>Hospitalized</td>
<td>Out-patient rehab</td>
<td>In-patient rehab</td>
</tr>
<tr>
<td>Significant laboratory findings?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total number of hospital days</td>
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</tr>
<tr>
<td>Total number of bed days</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of lost work days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated lost wages</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Permanently disability?</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>Nature of permanent damage, e.g. impaired vision, spinal cord injury</td>
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</table>
Challenges and Issues remaining to be addressed...

- **Clarification of HIPPA and IRB requirements**
  - Analysis of accessible de-identified data?
    - Expedited IRB review
  - Accumulating data on vulnerable populations?
    - Informed consent and full review required?
  - Accessing existing de-identified equine data?
    - Animal subjects review required?

- **Ethical and Legal issues**
  - Confidentiality
  - Discoverability
Designating and Training Data Collectors and Managers

- Who are the most logical and capable data collectors?
- What is the incentive for collecting accurate data?
- Assuring confidentiality should be provided to data collectors and managers?
- What perceived or real harms could accrue to participants (individuals, racetracks)?
- Developing a collaborative cohort of human and equine scientists
  - Collaboration preferable to competition for limited resources
  - Need a mechanism for identifying and communicating with scientists with interests in this industry
- Getting buy-in from horsemen and racetracks
  - Cultural shift from competition to collaboration
  - Valuing what collaboration with agencies and scientists can bring to the industry
  - Understanding that a healthy workforce contributes to a robust industry
Details, details, details...
Timing, Timelines, Costs and Funding

- ASAP especially in light of expectations for synthetic surfaces
- Two-year pilot for development of a surveillance system (based upon 20-25 pilot sites)
- Estimated cost over 2 yrs.-$500,000
- Funding sources?
- Potential for an R01?
For questions about this presentation, contact:
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