eSports: Where does the medical community fit in?

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eSport?

- What is eSports?
  - How did we get here
  - Is it a sport?
  - Are they “real” athletes?
  - How does the medical community fit in?
    - Preliminary data
    - Medical model
1972 Atari Pong

- 1972 Stanford lab 2 dozen students competed in Space War
- 1982 Atari invited 10,000 people to compete in Space Invaders

Initial thoughts of eSports?

1977 Joystick, color, sells millions

1979 Mattel 3 million sold

1980 Pacman Becomes the best selling arcade of all time

1985 failing gaming industry Nintendo is born

1989 Nintendo's game boy makes hand held gaming popular
Did you know?
2002 US Army releases Americas Army

- Americas Army game to help recruit a communicate with a new generation
1950 Claude Shannon and Alan Turing create chess programs

1962 The IBM-701 checkers program defeats a checkers master
College Over Watch Tournament

Team practices!
League of Legends (LoL) *Riot Games*

- Most popular title in eSports
- Multiplayer online battle arena game
- Players work together to take down their opponents’ base
- Strategize the best approach to attack opponents’ base and to protect their own
- 100 million monthly active users

*Overwatch* *Blizzard/Activision*

- Strong focus on team play
- Escorting a payload to a destination
- Protecting/attacking key points on a map

Example League of Legends

https://youtu.be/LNQ8nfvwcsf?t=9s
REVENUE FROM ESPORTS REACHED 1.7 BILLION DOLLARS IN 2017

Projected $2 billion by 2021
NFL ~ $13-$14 billion, MLB ~$10 billion, NBA ~$8 billion, NHL ~$4 billion
258 million viewers globally

22% of MILLENIAL MALES WATCH ESPORTS-
SAME NUMBER AS BASEBALL
WOMEN WERE HIGHER

NFL regular season 204 million
More people watched League of Legends Finals than Major League World Series
TOTAL PRIZE MONEY OF ALL ESPORTS EVENTS HELD IN 2017 OVER $65 MILLION

70% YEAR-ON-INCREASE
65% OF VIEWERS ARE UNDER THE AGE OF 65
SOLD OUT MSG
New York

SOLD OUT STAPLES CENTER
Los Angeles

SOLD OUT KOREAN WORLD CUP STADIUM
40,000 people

The International Olympic Committee (IOC) October 28, 2017 has accepted that eSports is a sporting activity. eSports will make its debut at the Asian Games this year.

eSport viewing

• **Twitch**
  - Founded in 2011
  - 40% of streaming - League of Legend finals had more viewers than the world series
  - One of leading internet traffic sources in North America
  - Video game streaming, talk shows, etc.
  - Amazon purchased Twitch.com in 2014 for $970 million dollars

• **You Tube**
  - Leader in eSports streaming

• **ESPN2/3** - The National Basketball Association (NBA) has developed NBA’s 2K league

• **TBS** - ELLeague

eSports and Intercollegiate Athletics

- June 2014 – Robert Morris University recognized eSports as varsity sport
  - $500,000 in “athletic” scholarships awarded
  - 2018 - 22 Colleges in the US currently offer scholarships for gaming
  - 50 collegiate varsity teams
  - >500 college eSport clubs

- The US is launching a competitive varsity high school league this fall
Most eSport teams placed in athletics department.

Problems?

• The National Association of Intercollegiate Athletics (NAIA) recognizes eSport as a sport

• Not yet sanctioned by National Collegiate Athletic Association (NCAA)-under investigation
  • Rules to follow if sanctioned
Is it a Sport?

**Definition of sport**
- a source of diversion: RECREATION
- physical activity engaged in for pleasure
- a particular activity (such as an athletic game) so engaged in

**Definition of athlete**
- a person who is trained or skilled in exercises, sports, or games requiring physical strength, agility, or stamina

https://www.merriam-webster.com/
**eSports a Sport?**

**Broad following:** sport must move beyond a game that is merely a local attraction or fad

- 90% 8-18 yo play video games 3-4x/week
- Boys - 16 hrs/week, Girls 9 hours/week
- 2-4 billion hours of live eSports footage streamed per year

eSports is physical exertion?

- Kane et al. the authors make the argument that eSport has been studied and that it fits the criteria for the physical exertion category
  - One game was played sitting
  - One was played standing and bowling
  - One high intensity game with abrupt arm movements while standing
  - The high intensity game produced the greatest change in V02 reserve. 4 METS.

Metabolic Equivalent (MET)

• MET-physiological measure used to define the energy cost of an activity based on oxygen consumption (V02).

• 1 MET = 3.5 mL.O2.kg

• Activity equivalents:
  • Gardening (no lifting) 4.4
  • Household tasks, moderate effort 3.5
  • Running 8-10

• 4 METS equivalent to raking leaves
Physical Activity and eSport

• Bronner, Pinsker, and Noah, (2013) male and female participants MET’s raised between 4-9 while participating in video games that involved dancing.

• Stroud et al., (2010) was able to get their participants VO2 and MET at a low to moderate activity level by standing and shaking Nintendo Wii controllers.

“This shows physical exertion being demonstrated during the playing of video games”

Does it? Not comparing the same task
Is it a Sport?

Skill: Involve play where chance or luck is not the sole reason for winning

- fast reflexes, good manual dexterity and excellent hand-eye co-ordination
- Skillful coordination of controller to manage on-screen avatar
- eSports require game sense and (tactical and strategic) judgment to act effectively
- Some evidence of increased cognitive capacity

eSport pros rapid rate of keyboard and mouse inputs
- 300/action moves per minute 10/per second

What do you think?
5 minutes +12 seconds Fischer clock
180-187

https://thechessworld.com/articles/training-techniques/how-many-hours-per-day-to-work-on-chess-according-to-gm-shipov/
https://www.nbcnews.com/technolog/how-fast-some-pro-gamers-make-10-moves-second-8C11422946

10 moves per second
500-600 action moves per minute 208-231
How does this impact on you as a health provider?
Jong Hyun “Mvp”

Because of pain in my spine, sometimes my arm will go numb. My shoulders feel terrible. Sometimes I can't even pick up the mouse” - Jong Hyun “Mvp”
Injuries in sports

“My wrist injury is something I simply cannot ignore, it limits my ability to play and its not fair to my team” Hai Lam 6 years pro RETIRED 26 years old
Injuries in professional sports

- Professional soccer teams lose an equivalent of 10 to 30% of player payroll to injury.

- 2014 knee injuries cost NBA $350 million.

- Difference?
  - Union
  - Health Insurance
### Nielsen ratings 2017

<table>
<thead>
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<th>Average gamer 13 years or older</th>
<th>Hours played daily</th>
</tr>
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<tbody>
<tr>
<td>2017</td>
<td>6.3</td>
</tr>
<tr>
<td>2013</td>
<td>5.6</td>
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<tr>
<td>2011</td>
<td>5.1</td>
</tr>
</tbody>
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### Common Sense Media 2016

- Teenagers - 25 times more free time playing video games than watching movies
- 13-18 yo approximately 1:20 a day on a console, computer, or mobile device

By the age of 21 the average child will have spent 10,000 hours playing video games.
“All We Want to Do Is Watch Each Other Play Video Games”¹

• “Esports arenas are the new movie theaters.”

• “Gamers are the new stars.”

May 2, 2018

Pilot Data

- 65 male collegiate eSport players
- 18-22 years of age
- 9 Colleges and universities across the United States
Most Common Complaint

Eye Fatigue

No  48%
Yes 52%
Digital Eye Strain

• Blurred Vision
• Eye Fatigue
• Red, dry or irritated eyes
• Headaches
• Back, neck and shoulder pain
BACK AND NECK PAIN

58% YES
42% NO
Players Who Experienced Hand Pain

- Yes: 30%
- No: 70%

Players Who Experienced Wrist Pain

- Yes: 36%
- No: 64%
Results

- Average play time - 5.5 hours a day
  - That increased to 8 hours with some 10+ hours before competition
- 15% reported 3 hours or more without a break
- 40% did not participate in any physical activity
- Only 2% sought any medical attention for any ailments
Guidelines for Children and Adolescents

• Children and adolescents should do 60 minutes (1 hour) or more of physical activity daily.

American College of Sports Medicine (ACSM)

“exercise deficit disorder”- less than 60 minutes of activity a day
HEALTH CONCERNS

• Hand injuries (carpal tunnel)
• Micro and macro trauma to neck muscles
• Vitamin D deficiency
• Poor diet
• Exercise Deficit Disorder
• Gaming Addiction (recognized by CDC this year)
• Social Disorders
• Sleep abnormalities
• Retinal Damage?
Internet Gaming Disorder

- Recurrent use of internet cause distress in 5+ of following for 1-year
  - Preoccupation with games (dominant activity in daily life)
  - Withdrawal from play
  - Tolerance
  - Unsuccessful attempt to control participation
  - Loss of interest in other hobbies
  - Use despite psycho-social problems
  - Deceived other about time spent
  - Games to escape negative feelings
  - Jeopardized job, relationship etc.

What about eSports psycho-social disorders?

- Withdrawal – athletes not permitted to play ANY sport likely irritable
- Tolerance- athletes spend more time at higher levels in play and preparation
- Loss of interest – Specify between dedication/passion and anhedonia
- Play despite psycho-social problems – social bonds through video games
- Internet to escape negative mood- play positive coping mechanism
- Jeopardized career opportunity or relationship – playing sport at a high level does result in sacrifice

- Consider professional poker player
  - DSM-5 specific caveat for gambling disorder
How to correct poor biomechanics

Preliminary Study

Viewing distance 20-40” or arm length

Top of monitor eye level or slightly below Flat screen

Overhead lighting dim so screen brightest in room

Arms at 90 degree angle
CURRENT STUDY

Postural assessment Game Play in Standardized Chair Compared with Gaming Chairs
1 hour of play, no rest in standard computer chair
Pilot Study of 10 NYIT eSport athletes (n=10)

- Melatonin
- Cortisol

- Natural circadian rhythm
- Normal,
- Our players
Based on this preliminary data:

**Collegiate eSport: Where Do We Fit In?**
Joanne DiFrancisco-Donoghue, PhD and Jerry R. Balentine, FACEP, FACOEP
ACSM Current Sport Medicine Review May 2018

**Contribution of Aberrant Postures to Neck Pain and Headaches in eSport Athletes**
Research & Investigations in Sports Medicine
Mark Gugliotti Dept. of Physical Therapy NYIT May 2018

**Managing the health of the eSport athlete: an integrated health management model**
Under Review British Journal of Sports Medicine
eSport health management model

- Physical/Occupational Therapy
- Osteopathic Medicine
- Psychiatry Psychology
- Primary Care
- eSport Athlete Evaluation
- Optometrist/Ophthalmology
- Nutritionist Registered Dietitian
- Athletic Trainers Exercise Specialists

https://www.nyit.edu/medicine/center_for_esports_medicine
The Physicians Role

- Gaming addiction-
  - Brief questionnaire on gaming addiction
- Evaluate social behavior
- Inquire about academic performance
- Evaluate vision-ask about symptoms of eye strain
- Inquire about musculoskeletal pains
  - How to they game? Chair, couch?
- Inquire about physical activity-
  - are they meeting minimum requirements
- Inquire about diet
  - Nutritional deficiencies, caffeine drink intake (GFuel, Monster)
- Inquire about sleep behaviors
- Do not rely on Body Mass Index
Physical/Occupational Therapy

Referral from the physician should hand, wrist, neck or back pain arise.

- Ergonomic evaluation of playing position
- Strengthening/Flexibility exercises
- Wrist and Hand ergonomics, assessments and treatment
- Postural Assessments, treatment
- Acute and Chronic Injury Management
eSport Medical Team

Psychiatry
Psychology

Optometrist/
Ophthalmology

Addiction &
Behavioral Health

evaluate retinal damage,
and photoreceptor
damage from excessive
blue light exposure
eSport Medical Team

- Athletic Trainers
  Exercise
  Specialists

- Nutritionist
  Registered
  Dietitian

- Assess behavior, habits, hydration, ergogenic aids

- Cardiovascular and muscular training, health management
Athletics department – should they be held to same standards?

**Typical NCAA Teams**
- Teams practice together
- Must maintain GPA
- Must have a physical to participate
- Protocols are followed:
  - E.g. return to play, concussion, surgery, orthopedic injuries
  - Curfews are set

**E-Sport Teams**
- Teams practice sometimes together - not necessary to do in person
- No GPA minimum standard
- There is no medical clearance needed - must rely on coach or individual to recognize issues
- No protocols established for return to play
- Curfews may be problematic
Positives
• It gives kids who do not participate in conventional team sports the ability to be apart of team competition.

Negatives:
• Health consequences
• Games change so careers can be over rapidly
• Pros have no union, no health benefits
Take home message:

Gaming and excessive gaming are likely to become more prevalent in the near future
• Whether or not you consider them athletes we are going to have new issues to address:
  • Repetitive strain injuries
  • Back and neck pain
  • Addiction and social disorders
  • Ramifications of sedentary lifestyle
• As a primary health care provider you may also be educating parents about health concerns regarding excessive gaming and their children
Questions?

Thank you.

Stay classy.

meme-generator.net