Learning Infection Control Via Games?
Dr. Anne-Gaëlle Venier, Centre Hospitalier Universitaire de Bordeaux, France
A Webber Training Teleclass

Learning infection control via games?

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Hosted by Paul Webber
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The control of HAI is a challenge

- Multiple improvement strategies
  - Educational programmes
  - Performance feedbacks
  - Guidelines
  - Bundles

- But difficult to change behaviors and beliefs

- Need for innovative tools!

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Games?
- A serious game is a game designed for a primary purpose other than pure entertainment
- Gamification is the use of game design elements in non-games contexts making use of the potential ability of games

Games?
- Principles of a game
  - Objective + Rules + Means
- Why do we play?
  - To have fun
  - To learn and grow
  - To overcome challenges
  - To interact with other people

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To gamify the work?

- Gamification everywhere?
  - Yes except if
    - The gamification is not adapted
    - If the context in the ward is not open

- Gamification: yes but only if...
  - You expect people change their behaviour
  - You can measure their progression
  - You can offer a feedback to players

Games to learn and change behaviour?

- Challenge
  - Major component of a game

- Key goal is the FLOW
  - Absorbed in the task
  - We forget what’s around us
  - We forget ourselves
  - Our brain is learning

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Games for health?

- Several games exist for healthcare workers or patients
  - Role-playing games, Serious video games
  - Gamification of serious procedures with goals to achieve

- Cochrane 2013 review neither confirmed nor refuted the utility of games as a teaching strategy for health professionals

- Literature since 2013
  - Games for healthcare workers and patients: improve behaviors
  - Games for health students: strongly engaging and stimulating to study longer
  - Methodological aspects could be improved

Serious games for infection control

- Games but few papers
  - Sax and Longtin. BMC Proc, 2011
  - Vasquez-Vasquez et al. SeGAH IEEE, 2011
  - Bertozzi et al. Gaming comput Mediat Simul, 2013
  - Castro-Sanchez et al. CGPIH, 2014
  - Venier et al. ARIC 2015
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Serious games – Cpias Nouvelle Aquitaine experience

- 2012 …Sarcoptes invasion (scabies)
- 2013 …Flu.0 (Flu)
- 2014 …Dojo résistance (XDR bacteria)
- 2015…Code Name UTI (urinary tract infection)
- 2017…I control (universal precautions)

https://www.cpias-nouvelle-aquitaine.fr/serious_games/

Serious games – Cpias Nouvelle Aquitaine experience

Main game design

- French or English-speaking video games
- Free, can be used everywhere, online or downloaded
- Healthcare worker avatar facing 8-9 scenes
  - 8 key point questions
  - 3 possible answers
  - explanation of why the answer is correct or not
- A final score evaluates the player’s performance

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SCORE
19 / 51

Pour suivant votre réflexion au sein de la colline de crise, vous
décidez de lister les contacts de M. Laksà en vue de leur proposer un
dépistage. Comment définissez-vous les contacts ?

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Does it work? Experience of Cpias NA

*Call for participation to play and evaluate the game*

*Questionnaire before and after the game*
  - Opinion on sentences about flu
  - What players learnt thanks to the game
  - Rate the game
  - Main thing they would do differently after this game

*Descriptive analysis – khi-square test for evolution*
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Results

264 physicians (213 fellows), 62 senior nurses, 577 nurse students

Rate given to the game 7.9/10

<table>
<thead>
<tr>
<th></th>
<th>Physicians / Senior nurses</th>
<th>Nurse students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before the game After the game</td>
<td>Before the game After the game</td>
</tr>
<tr>
<td>Seasonal flu = benign disease</td>
<td>156 (48%) 113 (35%)</td>
<td>207 (36%) 66 (12%)</td>
</tr>
<tr>
<td>Flu vaccination of health care workers = useful</td>
<td>302 (93%) 322 (99%)</td>
<td>496 (86%) 567 (99%)</td>
</tr>
<tr>
<td>I know the indications of the antiviral treatment</td>
<td>201 (62%) 280 (86%)</td>
<td>234 (41%) 423 (74%)</td>
</tr>
<tr>
<td>I feel well prepared to face a flu case</td>
<td>257 (79%) 309 (95%)</td>
<td>433 (75%) 556 (97%)</td>
</tr>
<tr>
<td>Well prepared to perform rapid flu diagnostic test</td>
<td>95 (29%) 280 (86%)</td>
<td>140 (24%) 433 (75%)</td>
</tr>
</tbody>
</table>

95% learnt at least one key point

Two key points
52% Physicians, senior nurses
82% Nurse students

Three Key points
16% Physicians, senior nurses
45% Nurse students
Results

94 % would change their practices after the game

- Better droplets precautions
  - Physicians/ Senior nurses 47%
  - Nurse students 80%

- Better Flu diagnosis
  - Physicians/ Senior nurses 17%

« Code Name UTI » evaluation

- Two case-control studies

- Students midwives
  - 17 played « Code Name UTI » in a classroom with voting keypads (15 min)
  - 16 read a leaflet during 15 min (same keypoints inside)

- Nurse students
  - 295 played « Code Name UTI » / 287 read the leaflet

- Questionnaire before and after the game
  - Same principle as Flu. 0
  - Before and after the intervention
  - Two months after the intervention for midwives
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Results

Game vs leaflet
- Learnings more specific
- Change of practices more precise
- More prepared to face a patient with a urinary catheter

Astrugue et al, in submission

So... Does it work?

- For students
  - Attractive and engaging to learn more
  - Helpful to have good practices?

- For Health care workers
  - Knowledge capitalization
  - Engaging for behavior change
  - Not time-consuming

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How to use games for infection control

- Check the users’ context is ok
- Choose the correct game for the correct population
  - Challenge adapted to the competences (novice/expert/master)
  - Game aimed to answer to a problem you want to solve

How to use games for infection control

- Use games!
  - During a learning session, in a multiple tool strategy, for a special day
  - Voting keypads/Computers/Smartphone

- Don’t be overconfident
  - Games can’t exert massive influence across all contexts
  - So… add briefing + debriefing +/- synthetic cognitive information

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Thank you for your attention

Learning infection control via games, does it work? Yes it can!

So why go without it?

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