A Visualisation tool for Augmenting Assessment of Ankylosing Spondylitis

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Part I: Introduction
Scenario

Research focus

Ms Angie Stone
AS Facts

- 1 in 1000 (in the U. K. ) affected
- A form of arthritis, HLA-B27, ARTS1 and IL23R involved. The cause remains unknown.
- It mainly affects the lower back. Other joints (e.g. hips, knees, ankles and shoulders), tendons and ligaments and areas including heart, lung, skin and eye.
- Main symptoms
- No cure for the moment
Current Treatment Approaches

- Pharmaceutical
  - Analgesics
  - Non-steroidal anti-inflammatory drugs (NSAIDs)
  - TNF– (α) blockers etc.

- Surgery
  - Hip replacement
  - Spinal osteotomy

- Physical therapy
  - Healthy lifestyle
  - Complementary therapies
  - Exercise

- Combinations
AS—A Test Condition

- Visual aspects of AS
- Multi faceted condition
  - Pain
  - Stiffness
  - Fatigue
- A specific case for more general conditions
Physio Treatment Process

- Pain
- Stress
- Fatigue
- Etc.

Assessment

Prescribe Treatment & Give Feedback

Appropriate Exercise?

Questionnaires, Scales, Measurements

Evaluation Tool
Part II: Materials and Methods
An Assessment Model

Subjective

Objective

Document

Make Sense

Determine

Plan

Feedback

Recommend

Treat

Perform

Discover

Learn
Current Measurement in AS

- **Five core assessment recommended by ASAS**
  - pain (intensity; measured by a visual analogue scale (VAS))
  - spinal stiffness/inflammation (morning stiffness duration; VAS),
  - functional ability (measured by the Bath Ankylosing Spondylitis Functional Index (BASFI) or Dougados Functional Index (DFI))
  - patient global assessment of health status (VAS)
  - spinal mobility

- **In UK, form completion and interview**
  - Subjective (mainly VAS)
  - Objective (mainly clinical measurement)
Towards Augmented Assessment

- 3-D beneficial over 2-D protocols
- Prototype start with BASFI
Part III: Results
“Bending forward to pick up a pen” -- BASFI

- VAS
- 3-D video

Easy ___________________ Impossible
“Looking over shoulder” -- BASFI

- Image
- 3-D video
Meaningful Feedback

Snapshots of BASFI Q. 2 in sequence. Image A with markers on as a beginning position; the following three images (B, C and D) are 3-D avatar without markers on; image E is screenshot of video output.

Note:
A start position with markers on
B, C and D position afterwards without markers on
E video output

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Part IV: Discussions and Future Work
Discussions and Future Work

- Laboratory based
- Towards lower technology environment
- Multi-faceted possibility
- Extending to objective measurement
- Extending to exercise
- Further evaluation undergoing
THANK YOU!
ANY QUESTIONS?