

Accuracy of an optical method for measuring the bite

Submission date 10/12/2014	Recruitment status Stopped	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 15/01/2015	Overall study status Stopped	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 22/01/2019	Condition category Oral Health	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

The study is about dental occlusion (contact between teeth) and the aim is to investigate the accuracy of a new, non-invasive 'optical' technique to measure the horizontal axis of the jaw (the axis the jaw rotates around, when a subject closes their mouth). This axis needs to be recorded for many dental procedures. Current (mechanical) methods are invasive, time consuming and inaccurate. A simple, accurate method would raise the standard of care through improved diagnosis, treatment planning and better fitting dental prostheses.

Who can participate?

Adult health professionals recruited via posters, group emails and announcements at the end of relevant lectures. This research is part of a PhD.

What does the study involve?

Participants undergo a dental examination to exclude disease. Traditional impressions are then taken of the upper and lower teeth. These are cast in dental stone then digitised, to create 'virtual' dental models. Two cameras photograph the subjects' front teeth. The teeth are illuminated with a pattern projected from a digital projector (rather than a camera flash). This combination enables accurate 3D photographs to be calculated. 3D photographs are taken at two differing degrees of jaw opening (one with the teeth almost touching, and one with a 10mm gape). The axis of jaw rotation can be calculated using these photographs, and the virtual models. The accuracy of this axis is investigated using two methods. Firstly, a 3D photograph is taken at an 'intermediate' jaw gape (5mm). The virtual models are rotated around the previously calculated axis, to produce an identical gape (5mm). The position of the virtual models is compared to the measured position. Secondly, the 'intermediate' jaw position is physically recorded, using dental bite registration paste (a fast-setting silicone paste, syringed between the teeth). This paste is removed, 3D-scanned and used to align the virtual models. This position is compared to the previously calculated position.

What are the possible benefits and risks of participating?

Not provided at time of registration

Where is the study run from?
University of Leeds (UK)

When is the study starting and how long is it expected to run for?
December 2014 to January 2015

Who is funding the study?
Faculty of Medicine and Health, University of Leeds (UK)

Who is the main contact?
Andrew Keeling
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

Protocol serial number
200658679

Study information

Scientific Title
Accuracy of optical recordings of the mandibular horizontal axis

Study objectives
With what accuracy can an inexpensive optical method record the mandibular horizontal axis?

Ethics approval required
Old ethics approval format

Ethics approval(s)
University of Leeds Dental Research Ethics Committee, 23/10/2014, ref. 200658679

Study design

Single centre - Observing and recording the jaw movements of dentate subjects using a novel optical method, and comparing this to a standard silicone bite registration method

Primary study design

Observational

Study type(s)

Diagnostic

Health condition(s) or problem(s) studied

Dental occlusion

Interventions

Subjects will have their jaw relationships measured using standard silicone bite registration material, and using a new optical method.

Intervention Type

Other

Primary outcome(s)

The distance between reference points on upper and lower digitised teeth will be compared using the standard (silicone) method and the new (optical) method

Key secondary outcome(s))

Repeatability of these measurements

Completion date

31/01/2015

Reason abandoned (if study stopped)

Lack of staff/facilities/resources

Eligibility**Key inclusion criteria**

Must have at least 4 upper and 4 lower anterior teeth

Participant type(s)

Health professional

Healthy volunteers allowed

No

Age group

Adult

Sex

All

Key exclusion criteria

No pre-existing disease of the temporo-mandibular joint (jaw joint)

Date of first enrolment

01/12/2014

Date of final enrolment

24/01/2015

Locations**Countries of recruitment**

United Kingdom

England

Study participating centre

University of Leeds

United Kingdom

LS2 9JT

Sponsor information**Organisation**

University of Leeds

ROR

<https://ror.org/024mrxd33>

Funder(s)**Funder type**

University/education

Funder Name

Faculty of Medicine and Health, University of Leeds

Alternative Name(s)

FMH

Funding Body Type

Private sector organisation

Funding Body Subtype

Universities (academic only)

Location

United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are/will be available upon request from Andrew Keeling (a.j.keeling@leeds.ac.uk)

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes