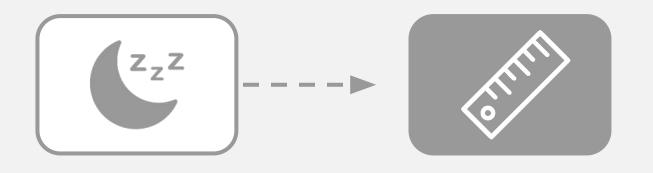
Nocturnal Scratch:

Ontology & Terminology



NOCTURNAL SCRATCH



Digital Measures Development

www.dimesociety.org/tours-of-duty/digital-measures-nocturnal-scratch

A project by the



Ontology of "Scratch"

Values (or nested properties) **Properties** Class Concepts Time (hours, minutes, seconds), % of total measured time, Total scratch duration # of bouts; average bout duration, average interval between bouts Scratch Scratching episode, Start/end Initiation timestamp/termination timestamp* scratching bout Scratch Minimum duration A short period of An action/behavior; Seconds scratching with defined of rhythmic and repetitive skin minimum duration and Minimum interval between bouts minimum pause interval contact movement Finger, palm, dorsum, elbow, knee, foot, other body part, non-body part between bouts Scratching tool As distinct from **itch**: Unpleasant cutaneous sensation Mild, moderate, severe* that may provoke a Intensity desire to scratch # of single scratch events Int (# of single scratch events in the scratching bout) Frequency of single scratch events Hz Rubbing, tapping, touching, pressing, etc. Movement type Articulation Fingers, wrist, elbow, arm, etc. Torso-including Back (TB) Head, Face, & Neck (HFN) Scratch area Scratch area Right Lower Extremity (RLE) Right Upper Extremity (RUE) Left Upper Extremity (LUE) Left Lower Extremity (LLE) Region of skin being directly Scratch area eczema scratched, Y/N including adjacent skin of the scratch area Scratch measurement modality Accelerometry, videography, Device model, evaluation method/ Metadata Surveys algorithm, device placement acoustic sensors, etc.

Other metadata

Measurement of Scratch

Defining the scratching bout

- Consistent with the literature, for each scratching episode (scratching bout), the following must be defined:
 - Minimum bout duration (e.g. 1s, 3s, 5s)
 - Minimum interval between bouts (e.g. >3s)
- Scratching bouts with intervals between that last less than the minimum interval between bouts are considered to be a single bout
- The initiation and termination timestamp (or frame) delimiting the scratching bout is required to be defined and determined by a suitable measurement modality (accelerometry, videography, acoustic sensors, etc.)

Total scratch duration is the main outcome measure of scratch, and is calculated as the sum of all scratch bouts during the measured period

Defining other scratching properties

- If using intensity property, each intensity label and differences between labels should be defined
- Scratch measurement modality needs to be defined in the metadata

Scratch intensity could be its own outcome measure, but in the ontology it makes sense to be a property of the scratching episode."

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Table 2. Outcome measures & properties for measurement of scratch

Nocturnal scratch outcome measures	Property	Use of property
Total scratch duration	(sum of all scratching bouts)	Required
	# of bouts	Optional
	Average bout duration	Optional
	Average interval between bouts	Optional
Scratching episode, scratching bout	Start/end	Required
	Minimum duration	Required
	Minimum interval between bouts	Required
	Scratching tool	Optional
	Intensity	Optional
	# of single scratch events	Optional
	Frequency of single scratch events	Optional
	Movement type	Optional
	Articulation	Optional
Scratch area	Scratch area	Optional
	Scratch area eczema	Optional
Metadata	Scratch measurement modality	Required (Device model, sensor & evaluation method/ algorithm as optional sub-properties)
	Surveys	Optional
	Other metadata	Optional

Measuring scratch is meaningful both as a COA (how patients feel & function), but also as a disease biomarker of the disease itself. One measure can thus contain two aspects."

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different depending on the COU: disease biomarker vs. clinical outcome assessment. For example, scratching intensity may be more relevant as a disease biomarker measuring response to therapy, while total scratch time may be more patient-relevant as a clinical outcome measure."

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Summary: Definition & outcome measures of nocturnal scratch

Definition of nocturnal scratch

Scratching is an action/behavior, of rhythmic and repetitive skin contact movement

Performed during a delimited time period of **intended and actual sleep**; not restricted to any specific time of the day or night

Outcome measures of nocturnal scratch

Total scratch time (sum of all scratch bouts) measured during a delimited measured period of intended and actual sleep within the total sleep opportunity

Total scratch time can be also represented as a percentage of the measured total sleep opportunity period

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Additional Relevant Resources

Publication of the literature review will be available here

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