SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Changi General Hospital
SingHealth

30.123 Healthcare Product Design

AY2023 Term 7

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NeeFindCatcher

WE USE NFC TECHNOLOGY TO DETECT ACUPUNCTURE NEEDLES

PROBLEM STATEMENT

Acupuncture needles may get dislodged from the patient's skin and fall onto the ground and into their clothing. The needles may then puncture into the patients skin and organs

EFFECTS

- Increased risk of infection
- Damage to tissues
- Pain and discomfort
- May lead to unpredictable complications due to migration of needles
- Psychological distress

ROOT CAUSES

- Needles may dislodge during electro-acupuncture treatment due to the vibration
- Needles may dislodge due to the movement of patient
- Manual accounting of needles used after treatment

CLINICAL NEED

A fail-safe design to detect needles that might have been dislodged from the patient's body

NEEDS CRITERIA

Must-have

- Able to detect needles that fall off onto the clothes of the patient
- Able to detect needles that fall off on the bed
- Does not interfere with the electroacupuncture treatment

Good to have

- Automate the accounting of needles to further reduce the possibility of human errors

RESULTS

	Performance Criteria	Naked Eye	Our Device
1	**Detection Range (cm)**	Limited to visible area	5cm
2	**Searching Time (s)**	300 sec	120 sec
3	**Detectability Under Clothing (%)**	NA	100%

P KEM N!

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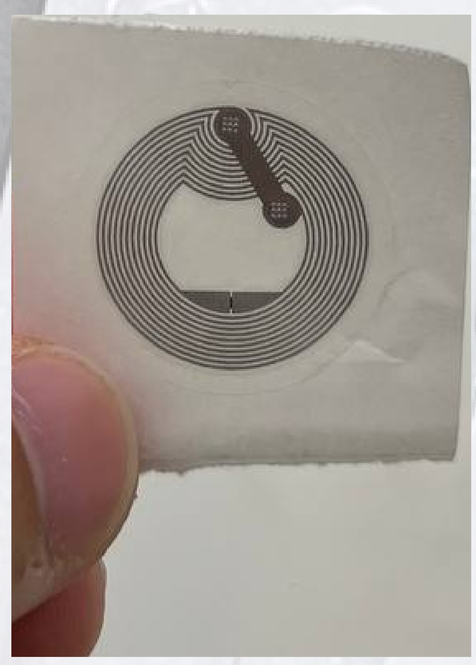
NFC INSPIRED DESIGN

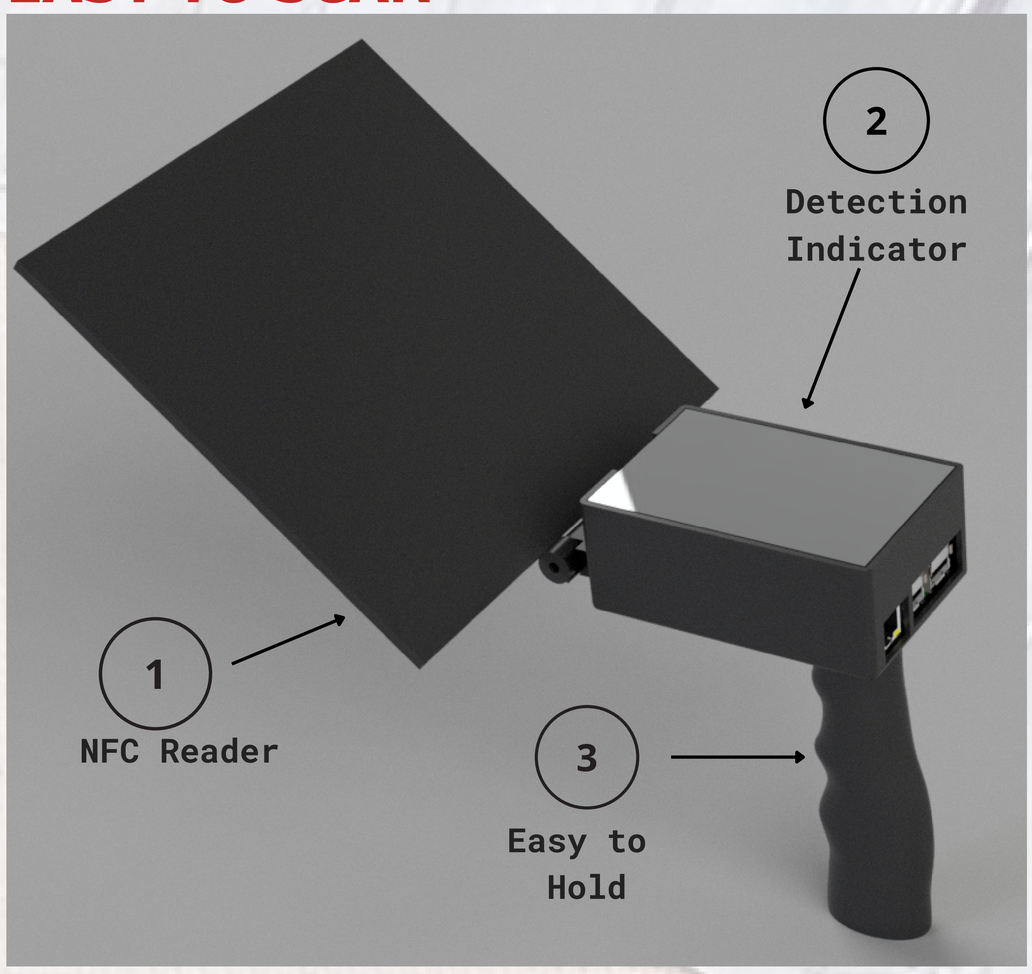
EASY TO ATTACH



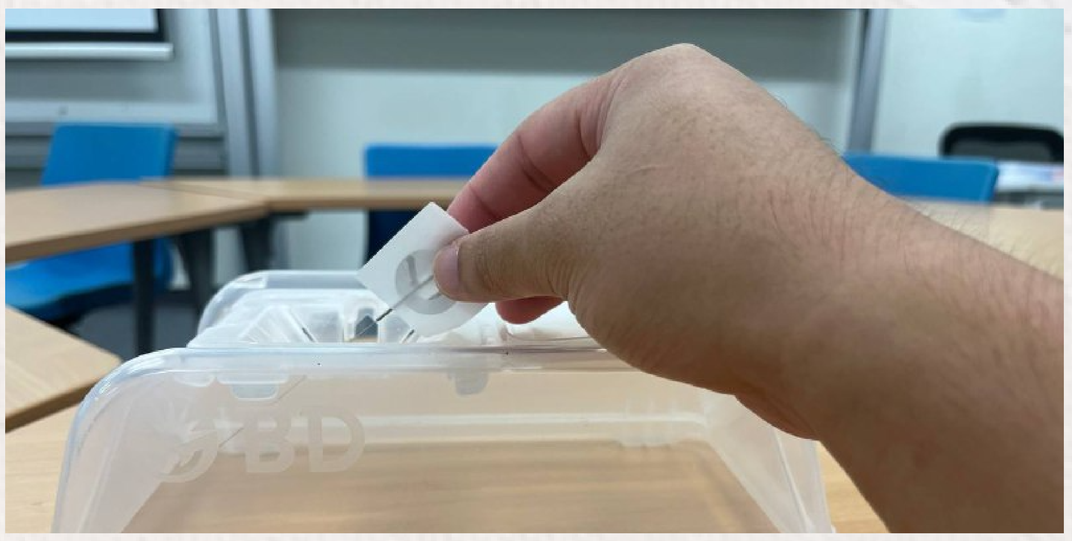
NFC TAG

Needles Tagged with NFC Sticker

EASY TO SCAN



EASY TO DISPOSE



Disposal of Needles into Sharp Bin As Per Normal