



Oxford Cambridge and RSA

Monday 12 June 2023 – Afternoon

Level 3 Cambridge Technical in Applied Science

05874 Unit 22: Global scientific information

INSERT



INSTRUCTIONS

- Do **not** send this Insert for marking. Keep it in the centre or recycle it.

INFORMATION

- This document has **4** pages.

Pre-release research brief

You should carry out your own research on the themes given in this research brief. Your research will help you to prepare for your examination.

Your research is only for your own use. You must not bring your notes into the examination. A clean copy of this research brief will be provided in the examination.

In your research you should consider the following themes.

Themes	Specification Section
• Categories of information holder	• 1.1
• Impacts on stakeholders	• 2.2
• Access issues raised by the transmission of scientific information	• 1.4
• The principles of the Data Protection Act (2018)	• 3.1
• Information security and risk	• 4.2

The questions in Section A of the examination will require you to draw on the knowledge and understanding which you have gained while researching these themes.

Instructions:

Read the following two pages of information.

Carry out your own research on the themes given above.

Wearable technology for monitoring asthma

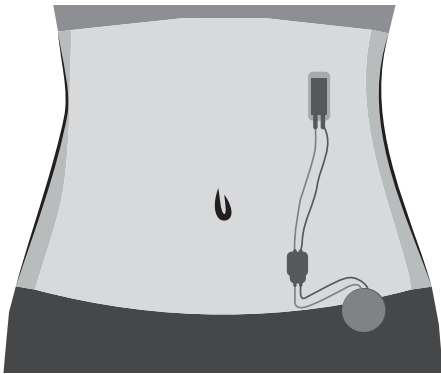
Asthma is a common lung condition that causes occasional breathing difficulties. Although it can normally be kept under control it is a serious condition that can cause a number of problems.

Common asthma triggers include:

- allergies (to house dust mites, animal fur or pollen for example)
- smoke, pollution and cold air
- exercise
- infections like cold or flu.

Identifying and avoiding asthma triggers can help to keep symptoms under control (1).

Leo Hastings has suffered from asthma since childhood. He is now studying for a PhD in the Biological Sciences department of a university. Leo is part of the Wearable Technologies Team researching the role of connected devices for monitoring long-term health problems such as asthma. He is currently evaluating a device that monitors breathing (2).



The device is based on a sensor which is attached to the skin above the lower ribs. The electrical resistance of the sensor changes as it stretches and retracts when the wearer breathes in and out. The resistance measurements are then transmitted by Bluetooth® to an app downloaded to a smartphone. The code of this app contains an algorithm that 'learns' the normal pattern of breathing for the patient and detects deviations that might indicate the onset of an asthma attack before the patient starts to experience symptoms. The patient's data is partially anonymised, encrypted and automatically backed up to the cloud where Leo can access it via a password.

Leo proposes to advertise on social media to find and recruit volunteers resident in the UK who have asthma. These volunteers will agree to wear the device and share their medical information. They must also have their own smartphone. To gain approval for his study Leo will submit his proposal to the University Ethics Committee. The proposal must include a data management plan to demonstrate how the study will comply with the Data Protection Act (2018) (3).

Before Leo writes his proposal, he searches the internet for useful guidance. He finds a data management plan template in the appendix of an NHS standard operating procedure (SOP) for Research Data Management and Security (4). He also reads an article which describes the cybersecurity issues related to the use of internet connected medical devices (5). Finally, he finds many useful links to legislation and guidance when using human participants in research at the UK Research and Innovation (UKRI) website (6).

Further information:

- 1 <https://www.nhs.uk/conditions/asthma/>
- 2 <https://www.newscientist.com/article/2193828-smart-skin-sticker-could-detect-asthma-attacks-before-they-happen/>
- 3 <https://www.gov.uk/data-protection>
- 4 <https://www.gmmh.nhs.uk/standard-operating-procedures-sops-and-guidance-documents/>
- 5 <https://globaldatahub.taylorwessing.com/article/connected-medical-devices-embedding-privacy-in-embedded-products>
- 6 <https://www.ukri.org/about-us/policies-standards-and-data/good-research-resource-hub/human-research-participants/>

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C345/2306