Project Deliverable C: **Design Criteria** GNG 1103 – Engineering Design

GNG1103, Section # ____C01___ Team # ___13___

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Introduction

We created a problem statement that indicates the need for a device that accurately tracks the heart rate and respiratory rate of an opioid user, the device will need to be able to call for help in the event of opioid overdose. Through meetings with our clients, we were able to identify our clients' needs and we were able to determine the functional and non-functional requirements of the device. We also consolidated a table of similar products to benchmark our device as well as find areas of improvement.

Functional Requirements

- Tracks heartbeat and respiratory rate
- Displays heartbeat reading
- Displays respiratory rate reading
- Ability to alert medical personnel in the event of opioid overdose

Non-Functional Requirements

- Aesthetics: Small and easy to bring around
- Appealing to use
- Low cost (100 CAD)
- Bluetooth and Internet connectivity

Constraints

- Cost
- Outlook of the product
- Technology regarding small wearable devices

Design Criteria

Requirement	Rank (out of 5)	Criteria
Tracks vitals	5	The device must be able to accurately track the user's respiratory rate, heart rate and oxygen percentage. The device should have no lag so to accurately provide information to users.
Alerting Medical Personnel	5	The device must be able to send a signal to emergency medical personnel as soon as the vital
Battery Capacity	4	The device is preferred to have a decent battery life

		to support heavy usage.
Wearable device	4	The device can be a wearable device for the convenience of users
Usability	4	The device should be practical and easy to use for users.
Responsiveness	3	The device must not be too easily triggered as this will cause unnecessary inconvenience to the user.
Water-Resistant	3	The device should be water-resistant, just in case if the user is drowning or in a condition where the device might be in contact with water
Internet Accessibility	2	The device should be able to access the internet to provide information such as location etc.

Picture			
Company	TUGER	FIIL	BEITONY
Cost	28.5 CAD	59.9 CAD	43.96 CAD
Weight	59g	59g	99.8g
Size	5.9*3.6*3.3cm	**XYY**	9.1*8.6*3.6 cm

Accuracy	1.The product features adaptive optical measurement technology to accurately measure and pulse rate in 10 seconds 2.99.9%accurate measurement	SPO2:70% - 99% ±2% PR: 1%/1bpm It also shows the Plethysmograph Wave, which ensures accuracy.	You can measure blood pressure, heart rate, or blood oxygen continuously and automatically.
Connectivity function	Led monitor and pulse rate to know the health of your family members.	Auditory alarm can be set to warn you when your SpO2 and Pulse Rate are beyond set limits	Including IOS 9.0, Android 4.4, or Bluetooth 4.0.Wireless data syncs from the tracker to the phone
Alarm	The audible alarm system will alert you when your SpO2 and pulse rate exceed the set limits (SpO2 range: 70% - 100% ± 2 digits, pulse rate range: 25-250 ± 2 digits)	Auditory beep can also be set to accompany each detected pulse beat.Two-color LED screen brightness can be adjusted, a total of 4 levels of brightness can be adjusted .	Including call alert, message alert, you can receive notifications from your phone's APP, and set range of data.

Discussion

Deciding the ultimate function of our product has been a challenge for our team. At first, we are in a dilemma whether the ultimate function of our product should be to alert medical personnel or to inject the user with Naloxone in the event of opioid overdose. However, due to ethical reasons of injecting the user with an automated device. Our team have decided that the ultimate use of our product would be to alert medical personnel in the event of opioid overdose. We also acknowledge that as some of our needs are not ranked as highly as other needs, but there will be changes when we apply them to our design ideas.

Conclusion

We have to put much focus into the programming work for our device. As our device's purpose is to read vitals and send emergency signals, it is important that our programming work has to be done well in order to ensure that there are no hiccups with the device's operations.The criteria and requirements listed here would help us to refine our design and development, helping us to reach the best version of the device which we aim to create. In order to ensure that or device does not fall short to pre-existing designs, we have to constantly benchmark our device against others so that it can well suit the market needs while staying in competition as much as possible.