

## Background

- Postpartum hemorrhage is a preventable cause of maternal morbidity and mortality most often caused by mismanagement either due to a delay in diagnosis or a delay in treatment (Dillion et al., 2021).
- The National Partnership for Maternal Safety Obstetric Hemorrhage bundle includes readiness as a domain. This includes utilizing a checklist for emergency response of hemorrhage, unit education, and unit drills (Main et al., 2015).
- At the University of Cincinnati Medical Center, a total of 2,543 deliveries occurred in 2023, with 1,699 vaginal deliveries and 844 cesarean sections. The number of patients receiving four or more units of blood included 23 patients, which increased from years prior (17 patients in 2022, and 18 patients in 2021).
- **Problem Statement:** Obstetric hemorrhage is a preventable cause of maternal morbidity and mortality. For obstetric healthcare providers, a hemorrhage safety bundle is available to equip providers with the education and simulation skills needed to gain competency in caring for this obstetric emergency.

## Available Knowledge

- Interdisciplinary simulation training for maternal hemorrhage has been shown to decrease times between administration of life saving uterotonics as well as increased awareness of the signs and symptoms associated with hemorrhage (Gerard et al., 2022).
- The Joint Commission now recommends role specific education on maternal hemorrhage for new hires, with every policy change, and every two years (2019).

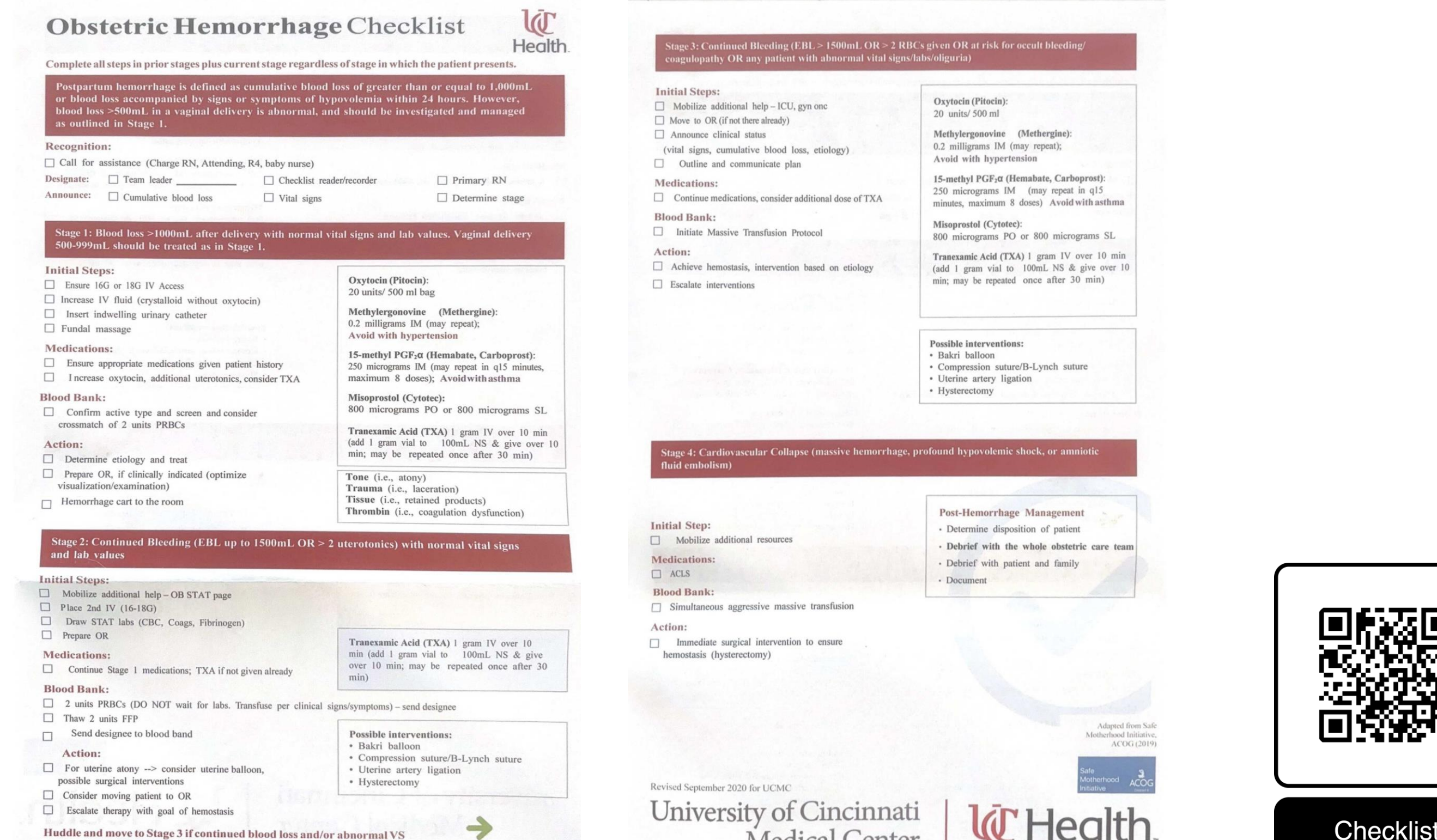
## The Iowa Model

The Iowa Model is an evidence-based practice model that allows for easy implementation of change within the healthcare system (The Iowa Collaborative, 2017).

Identifying Trigger	Forming a Team	Assembling Literature	Piloting Change	Evaluating the Implementation
<ul style="list-style-type: none"> <li>• Role specific education required for maternal hemorrhage</li> <li>• Maternal hemorrhage continues to be the highest cause of preventative maternal morbidity and mortality</li> </ul>	<ul style="list-style-type: none"> <li>• SRNAs, L &amp; D nurse managers and educators, simulation instructor</li> <li>• DNP project committee members</li> </ul>	<ul style="list-style-type: none"> <li>• A checklist is the recommended management for emergency response.</li> <li>• American College of Obstetrics and Gynecology provides a specific checklist for management of maternal hemorrhage that incorporates the latest evidence-based practice.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide staff with educational PowerPoint via email prior to simulation</li> <li>• Implement a high-fidelity simulation experience using a maternal hemorrhage scenario in an L &amp; D room</li> </ul>	<ul style="list-style-type: none"> <li>• A hemorrhage checklist was used to evaluate the number of boxes checked in each stage of hemorrhage pre and post debriefing session.</li> <li>• A team assessment tool was used to evaluate teamwork pre and post debrief.</li> <li>• A Likert scale was given post debrief to evaluate knowledge, comfort and, and likelihood of using checklist in the future.</li> </ul>

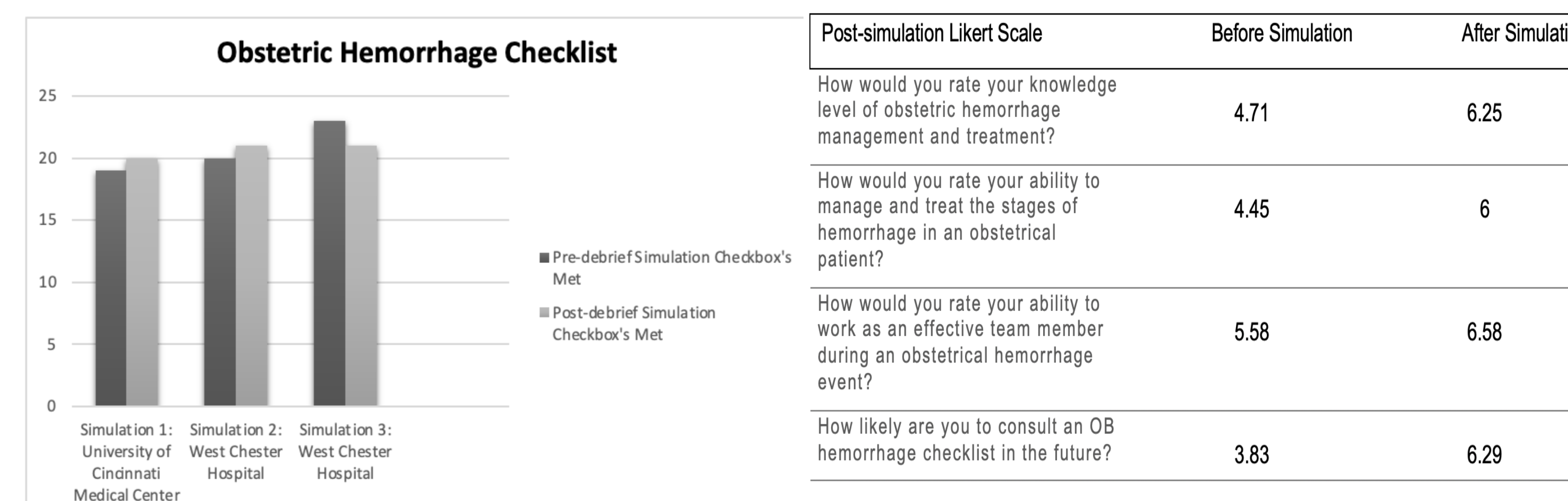
## Methods

- Simulation instruction training was provided by The University of Iowa and entailed lectures regarding simulation design, pre briefing, debriefing, and navigating difficult debriefing situations.
- A high-fidelity simulation instructor from the University of Cincinnati was recruited to assist with simulations and provide simulation supplies
- Participation included registered nurses, obstetricians, residents, nurse anesthetists, respiratory therapists, and surgical technicians, as well as other members responding to OB stat pages.
- Prior to the simulation, an education email about maternal hemorrhage management was sent out by nurse educators.
- Once the simulation was run, a debriefing session took place, followed by a second run through of the same simulation scenario. A total of three simulations took place. One at University of Cincinnati Medical Center during dayshift and two at West Chester Hospital, one day shift and one night shift simulation.
- The results were based how many checkboxes were checked pre and post debriefing session.
- The Perinatal Emergency Team Response Assessment tool was used during simulations to grade teamwork based on seven different categories.
- A Likert scale was then given post debrief to assess knowledge and comfort of maternal hemorrhage management and the likelihood of using the scale in the future.



The image shows a detailed 'Obstetric Hemorrhage Checklist' with multiple stages (Step 1, Step 2, Step 3) and various checkboxes for actions like 'Call for assistance', 'Monitor vitals', 'Administer medications', and 'Notify providers'. It also includes a QR code labeled 'Checklist'.

## Results / Outcomes



Post-simulation Likert Scale	Before Simulation	After Simulation
How would you rate your knowledge level of obstetric hemorrhage management and treatment?	4.71	6.25
How would you rate your ability to manage and treat the stages of hemorrhage in an obstetrical patient?	4.45	6
How would you rate your ability to work as an effective team member during an obstetrical hemorrhage event?	5.58	6.58
How likely are you to consult an OB hemorrhage checklist in the future?	3.83	6.29

### Perinatal Emergency Team Response Assessment Scale

Category	Simulation 1: Pre-brief	Simulation 1: Post-brief	Simulation 2: Pre-brief	Simulation 2: Post-brief	Simulation 3: Pre-brief	Simulation 3: Post-brief
Shared Mental Model	12	14	12	12	12	14
Communication	23	32	26	27	28	31
Situational Awareness	17	18	17	15	16	19
Leadership	14	18	16	14	14	18
Followership (non-leader members)	19	22	19	22	18	21
Workload Management	15	21	19	23	17	23
Positive/Effective Attitudes	24	28	24	29	21	20

## Discussion

- The hemorrhage checklist showed some increase in number of boxes checked pre debriefing versus post debriefing in two out of the three simulations but there was no statistical significance found. The Perinatal Emergency Team showed and increase or no change at all in the seven different categories, these results were not statistically significant. The results of all questions in the Likert scale showed statistical significance (p-value < 0.05), showing that participants gained knowledge and confidence in the ability to manage maternal hemorrhage and are more likely to use the hemorrhage checklist in the future,
- Strengths of this project include the small scale pre/post implementation design which allowed for rapid review of the checklist implementation. This initiative gained buy-in from stakeholders, as this is a Joint Commission requirement to provide simulation for all new-hires and current employees annually. This topic also gained national support by two other Nurse Anesthesia programs conducting the same project including The University of Iowa and Louisiana State University.
- The authors note several limitations to this project implementation. The first is the small sample size due to only three simulations conducted due to labor and delivery staffing issues. Additionally, the analysis was only performed through a single institution at The University of Cincinnati Medical Center and West Chester Hospital, a small community location of UC Health. No statistical significance was found in comparison between the four stages of hemorrhage using the checklist to compare pre-debriefing to post-debriefing simulations

## Conclusions

- Obstetric hemorrhage remains a leading cause of maternal morbidity in mortality despite readily available uterotonic agents and resources
- Gaps in standardization of team response and training remain an opportunity for improvement.
- The next steps are to continue to simulate a postpartum hemorrhage on labor and delivery units to provide time to practice necessary technical skills, team dynamics, and checklist-based management.

## References/ Appendices

