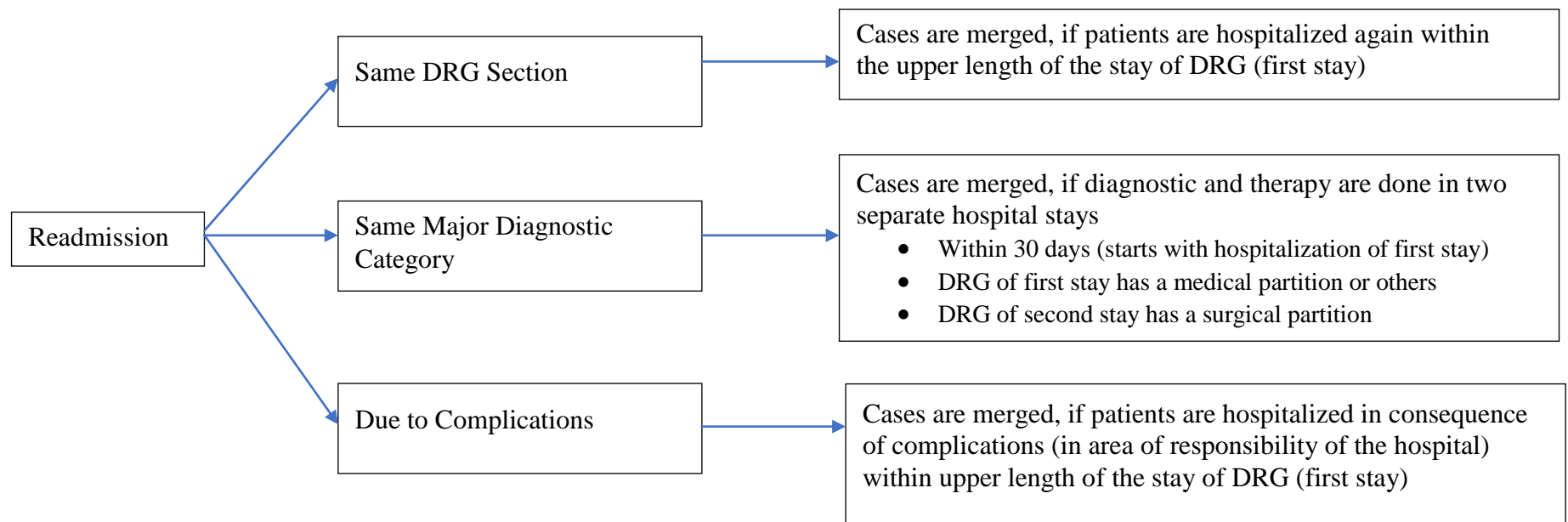


**Economic implications of adding a novel algorithm to optimize cardiac resynchronization therapy: rationale and design of economic analysis  
for the AdaptResponse trial**

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**SUPPLEMENTAL APPENDIX**

**Figure A1.** Three types of readmission considered in German



**Table A1.** Heart Failure hospitalization statistics and applicable national tariffs in United States (US), Canada, England, Germany, France, Switzerland, and Japan

Country	DRG Code	DRG Label	Number of hospital episodes per DRG	Total expenditure per DRG	Average expenditure per DRG	Average expenditure for combined HF DRGs (2018 USD)
US Medicare <sup>a</sup>	291	Heart failure & shock w mcc or peripheral extracorporeal membrane oxygenation (ecmo)	369,287		\$8,214	\$7,389 (\$7,389)
	292	Heart failure & shock w cc	104,082		\$5,616	
	293	Heart failure & shock w/o cc/mcc	36,153		\$4,064	
US Private Insurance <sup>b</sup>	291	Heart failure & shock w mcc or peripheral extracorporeal membrane oxygenation (ecmo)	19,262		\$12,677	\$12,235 (\$12,235)
	292	Heart failure & shock w cc	11,946		\$12,471	
	293	Heart failure & shock w/o cc/mcc	3,651		\$9,133	
England <sup>c</sup>	EB03A	Heart Failure or Shock, with CC Score 14+	23,426	£77,199,093	£3,295	£1,980 (\$2,808)
	EB03B	Heart Failure or Shock, with CC Score 11-13	41,789	£102,593,387	£2,455	
	EB03C	Heart Failure or Shock, with CC Score 8-10	45,039	£80,646,048	£1,791	
	EB03D	Heart Failure or Shock, with CC Score 4-7	46,458	£61,226,546	£1,318	
	EB03E	Heart Failure or Shock, with CC Score 0-3	10,983	£10,321,647	£940	
France <sup>d</sup>	05M091	Heart failure and circulatory shocks, level 1	8,089	€20,645,069	€2,552	€3,543 (\$4,178)
	05M092	Heart failure and circulatory shocks, level 2	35,857	€118,278,259	€3,298	
	05M093	Heart failure and circulatory shocks, level 3	43,029	€192,919,661	€4,483	
	05M094	Heart failure and circulatory shocks, level 4	10,238	€68,769,875	€6,717	
	05M09T	Heart failure and circulatory shocks, very short stay	19,833	€14,084,207	€710	
Germany <sup>e</sup>	F62A	Heart failure and shock with extremely severe complications or comorbidities, with dialysis or complicated diagnosis or with certain high-intensity intensive care treatment > 196/184/368 points or complex constellation	1,516	€15,815,185	€10,432	€7,664 (\$9,037)
	F62B	Heart failure and shock with extremely severe	3,381	€27,007,023	€7,988	

		complications or comorbidities, with dialysis or complicated diagnosis or with certain disabilities with a high amount of efforts or without complex constellation, more than one day length of stay with a certain acute renal failure with extremely severe complications or comorbidities				
	F62C	Heart failure and shock without extremely severe complications or comorbidities or without dialysis, without complicated diagnosis, without complex constellation, without certain disabilities with a high amount of efforts, more than one day length of stay without a certain acute renal failure with extremely severe or without complications or comorbidities	286,720	€2,274,796,339	€7,934	
	F62D	Heart failure and shock without extremely severe complications or comorbidities or without dialysis, without complex diagnosis, without complex constellation, without any particular high-level treatment, an occupancy day	17,685	€52,780,529	€2,984	
Switzerland <sup>f</sup>	F62A	Heart failure and shock with extremely severe CC, with dialysis or reanimation, or complication diagnosis	786	CHF 14,217,168	CHF 18,088	CHF 10,108 (\$10,324)
	F62B	Heart failure and shock with extremely severe CC	4,916	CHF 64,402,058	CHF 13,100	
	F62C	Heart failure and shock	12,207	CHF 102,398,420	CHF 8,388	
Canada <sup>g</sup>	NA	NA	NA	NA	CAD 10,412	CAD 10,412 (\$8,028)
Japan <sup>h</sup>	NA	NA	NA	NA	¥524,301	¥524,301 (\$4,748)
Greece <sup>i</sup>	K42X	Heart Failure and Collapse without Catastrophic Co-existing Conditions and Complications and with Average Length-of-Stay	NA	NA	€849	NA
	K42M	Heart Failure and Collapse with Catastrophic Co-	NA	NA	€1,868	NA

		existing Conditions and Complications and with Average Length-of-Stay				
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**Source:**

- a. Data on file. Premier data. 2010-2018 using the Instant Health Data (IHD) platform (BHE, Boston, MA)
- b. Data on file. Truven MarketScan. 2008-2017 using the Instant Health Data (IHD) platform (BHE, Boston, MA)
- c. NHS Improvement. Reference costs for 2017/18. Accessible at: <https://improvement.nhs.uk/resources/reference-costs/#rc1718>. Reference cost tariffs are representative of the national average of volume of patients coded using each HRG Code for the year 2017-2018.
- d. Public hospital statistics for 2018: Technical Agency for Information on Hospital Care (ATIH). Accessible at: <https://www.scansante.fr/applications/statistiques-par-groupes-diagnostique-actes>. 2018 tariffs were applied.
- e. Hospital statistics for 2017: Institute for the Hospital Remuneration System (InEK). Accessible at: [https://www.g-drg.de/Datenbrowser\\_und\\_Begleitforschung/Datenveroeffentlichung\\_gem.\\_21\\_KHEntgG/G-DRG-Browser\\_2017\\_2018](https://www.g-drg.de/Datenbrowser_und_Begleitforschung/Datenveroeffentlichung_gem._21_KHEntgG/G-DRG-Browser_2017_2018). 2017 tariffs were applied.
- f. Hospital statistics for 2017: Federal Statistical Office (OFS). Accessible at: <https://www.bfs.admin.ch/bfs/en/home/statistics/catalogues-databases/press-releases.assetdetail.6406959.html>. 2017 tariffs were applied.
- g. Charbonneau E, Parent H, O’Hara GE, Champagne J, Philippon F. Canadian Journal of Cardiology (2018), doi: 10.1016/j.cjca.2018.05.001.
- h. Japan tariff of Diagnosis Procedure Combination (DPC) hospitalization fee.
- i. Closed Consolidated Hospitalization Tariff (“Κλειστά Ενοποιημένα Νοσήλια” – KEN). Accessible at: <https://www.moh.gov.gr/articles/health/domes-kai-draseis-gia-thn-ygeia/kwdikopoihseis/kleista-enopoihmena-noshlia/1079-nea-lista-ken-apo-1-3-2012-kostos-mdn?fdl=3769>. 2012 tariffs remain valid and unadjusted. Please note Greek KEN prices do not include labor costs that are funded separately; only material and facility costs are included.

**Table A2.** Cost profile of HF hospitalization for CRT patients after implantation in the U.S. hospitals

<b>HF Hospitalisation After CRT-D/CRT-P Implantation (N=7,687)</b>	<b>Mean</b>	<b>%</b>	<b>SD</b>	<b>Min</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>	<b>Max</b>
<b>Total Costs (\$USD, 2018)</b>	<b>10,679.01</b>	<b>100%</b>	<b>17,912.79</b>	<b>0</b>	<b>3,915.58</b>	<b>6,312.89</b>	<b>11,099.73</b>	<b>372,822.33</b>
Lab Exams	754.84	7.07%	1,155.55	0	305.70	488.15	820.52	32,641.52
Emergency Room	342.02	3.20%	371.69	0	206.75	329.22	453.85	17,311.59
Cardiology Ward	502.90)	4.71%	1,391.13	0	46.79	191.55	398.40	60,670.70
Operating Room	537.25	5.03%	4,980.86	0	0	0	56.35	245,098.17
Other	537.25	5.14%	4,980.86	0	0	79.82	442.57	35,973.84
Radiology	338.01	3.17%	514.60	0	74.22	165.20	387.69	10,206
Respiratory	377.82	3.54%	937.26	0	0	71.31	367.42	22,990.81
<b>Room and Board</b>	<b>5,884.43</b>	<b>55.10%</b>	<b>7,481.67</b>	<b>0</b>	<b>2,108.09</b>	<b>3,775</b>	<b>6,825.08</b>	<b>132,895.13</b>
Supplies	1,161.89	10.88%	9,015.55	0	0	49.68	257.63	316,933.64
Therapy	230.63	2.16%	658.88	0	0	0	256.12	15,703.04
	<b>Mean</b>		<b>SD</b>	<b>Min</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>	<b>Max</b>
<b>HF Hospitalisation Days-in-Hospital (N=7,687)</b>	5.11		4.94	1	2	4	6	93
<b>HF Hospitalization Cost-Per-Day-Hospitalised (\$USD, 2018, N=7,687)</b>	2,122.58		2,052.63	0	1,305.28	1,731.37	2,339.25	70,948.56

Source: Data on file. Premier data. 2010-2018 using the Instant Health Data (IHD) platform (BHE, Boston, MA)