CHEERS Checklist
Items to include when reporting economic evaluations of health interventions

The **ISPOR CHEERS Task Force Report**, *Consolidated Health Economic Evaluation Reporting Standards (CHEERS)—Explanation and Elaboration: A Report of the ISPOR Health Economic Evaluations Publication Guidelines Good Reporting Practices Task Force*, provides examples and further discussion of the 24-item CHEERS Checklist and the CHEERS Statement. It may be accessed via the *Value in Health* or via the ISPOR Health Economic Evaluation Publication Guidelines – CHEERS: Good Reporting Practices webpage: http://www.ispor.org/TaskForces/EconomicPubGuidelines.asp

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as "cost-effectiveness analysis", and describe the interventions compared.	1
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	1
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study. Present the study question and its relevance for health policy or practice decisions.	3
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	3-4
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	3-4
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	3-42
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	3-4
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	3-4
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	N/A
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	3
Measurement of effectiveness	11a	*Single study-based estimates:* Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	N/A

	11b	*Synthesis-based estimates:* Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	N/A
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	N/A
Estimating resources and costs	13a	*Single study-based economic evaluation:* Describe approaches used to estimate resource use associated with the alternative interventions. Describe primary or secondary research methods for valuing each resourcetem in terms of its unit cost. Describe any adjustments made to approximate to opportunity cost	3
	13b	*Model-based economic evaluation:* Describe approaches and data sources used to estimate resource use associated with model health states. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	3-4
Currency, price date, and conversion	14	Report the dates of the estimated resource quantities and unit costs. Describe methods for adjusting estimated unit costs to the year of reported costs if necessary. Describe methods for converting costs into a common currency base and the exchange rate.	3-4
Choice of model	15	Describe and give reasons for the specific type of decision-analytical model used. Providing a figure to show model structure is strongly recommended.	N/A
Assumptions	16	Describe all structural or other assumptions underpinning the decision-analytical model.	Appendix Table 2
Analytical methods	17	Describe all analytical methods supporting the evaluation. This could include methods for dealing with skewed, missing, or censored data; extrapolation methods; methods for pooling data; approaches to validate or make adjustments (such as half cycle corrections) to a model; and methods for handling population heterogeneity and uncertainty.	and Appendix Table 3 N/A
Results			
Study parameters	18	Report the values, ranges, references, and, if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	Appendix Table 2
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	5
Characterising uncertainty	20a	*Single study-based economic evaluation:* Describe the effects of sampling uncertainty for the estimated incremental cost and incremental effectiveness parameters, together with the impact	Table 1; Table 2

		of methodological assumptions (such as discount rate, study perspective).	
	20b	*Model-based economic evaluation:* Describe the effects on the results of uncertainty for all input parameters, and uncertainty related to the structure of the model and assumptions.	Table 1 and Table 2
Characterising heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	7-8
Discussion			
Study findings, limitations, generalisability, and current knowledge	22	Summarise key study findings and describe how they support the conclusions reached. Discuss limitations and the generalisability of the findings and how the findings fit with current knowledge.	7-8
Other			
Source of funding	23	Describe how the study was funded and the role of the funder in the identification, design, conduct, and reporting of the analysis. Describe other non-monetary sources of support.	7-8
Conflicts of interest	24	Describe any potential for conflict of interest of study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors recommendations.	7-8

For consistency, the CHEERS Statement checklist format is based on the format of the CONSORT statement checklist

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The citation for the CHEERS Task Force Report is:
Husereau D, Drummond M, Petrou S, et al. Consolidated health economic evaluation reporting standards (CHEERS)—Explanation and elaboration: A report of the ISPOR health economic evaluations publication guidelines good reporting practices task force. Value Health 2013;16:231-50.

Figure 1

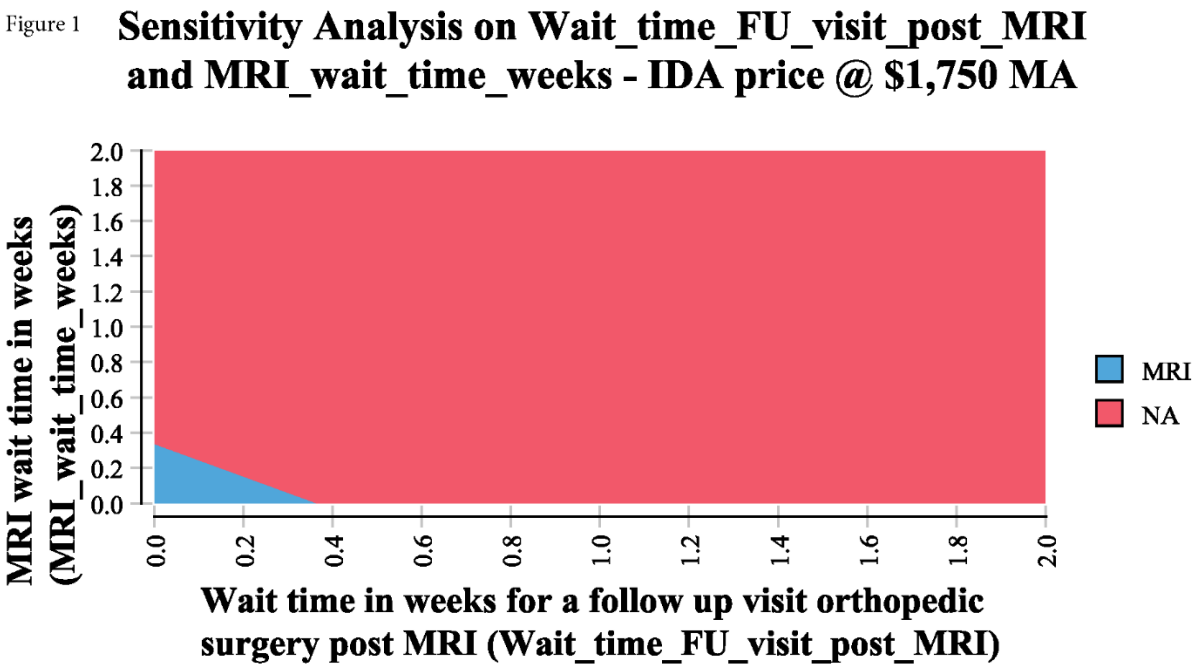


Figure 2

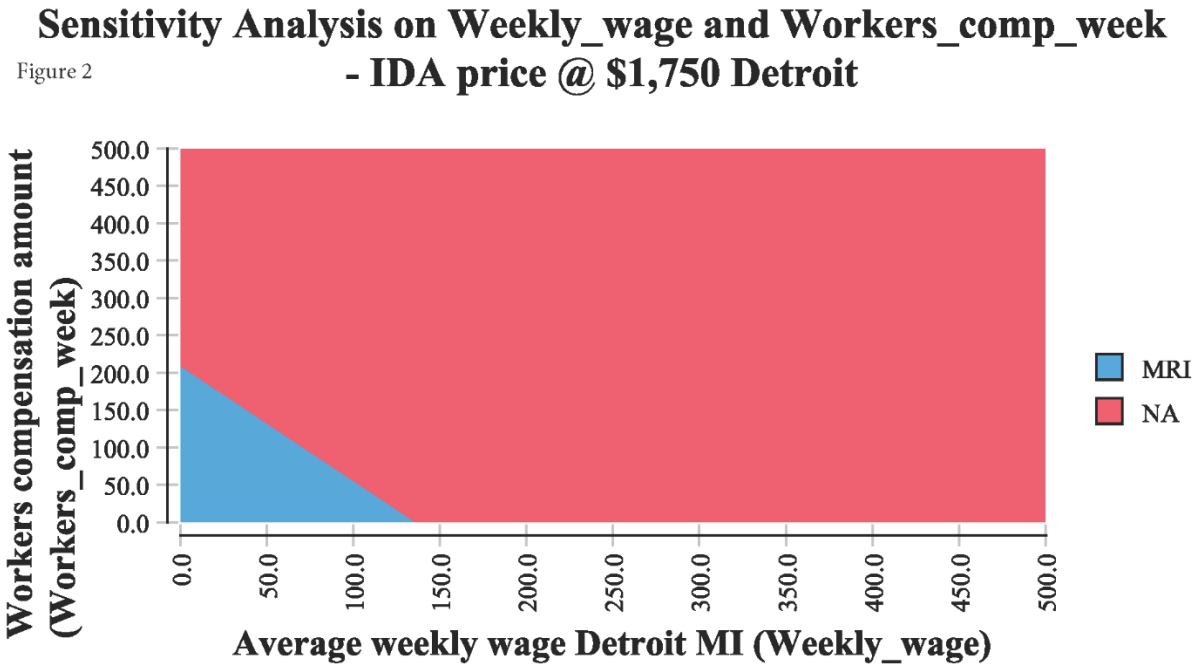


Figure 3

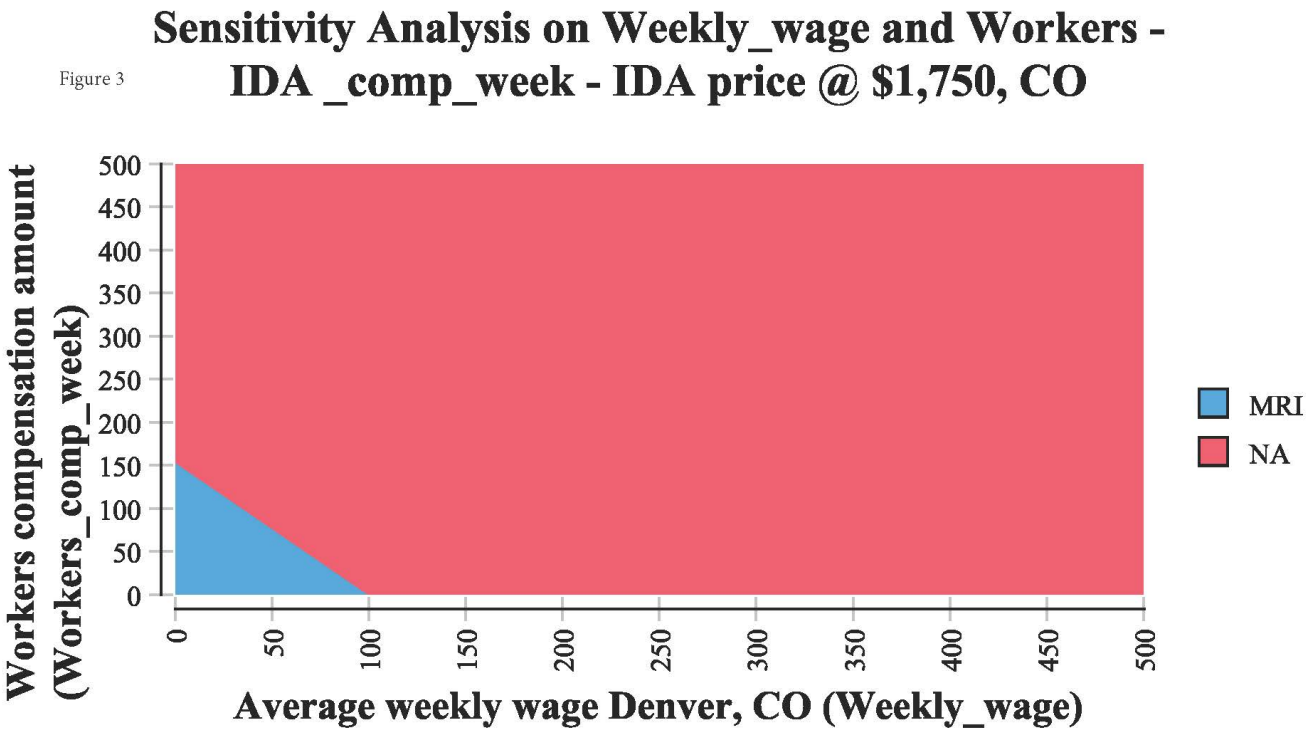
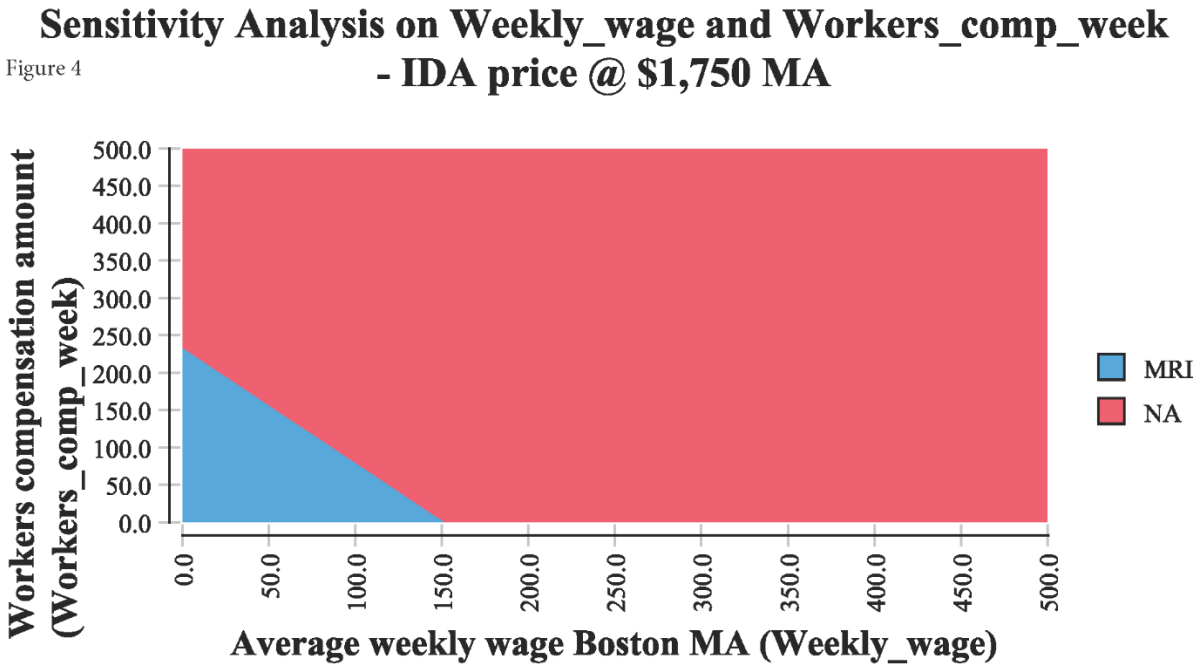


Figure 4



Appendix Table 1 (Private pay assessment - knee):

Chronology	MRI		IDA	
	Item	cost	Item	cost
Visit 1	CPT 99203 (E/M) (D)	$273 CO $196 CA $142 MA $133 MI	CPT 99204 (E/M) + CPT 29870	$1,612 CO $1,030 CA $1,203 MA $936 MI
Wait – 2.4 weeks for MRI	Worker's comp/disability (IN)	$1,867 MA $1,651 MI $1,450 CA $1,390 CO		
	Company productivity loss (assumes multiplier of 1.61) (IN)	$5,008 MA $4,316 CA $3,988 MI $3,358 CO		
Visit 2	CPT 73721 (MRI knee) (D)	$1,220 CA $774 CO $577 MI $444 MA		
	Patient co-pay (D)	$88		
	Patient time – only if worker's comp not applicable (2 hrs.) (IN)	$73		
Wait – 1.71 weeks for F/U office visit	Worker's comp/disability (IN)	$1,347 MA $1,274 CA $ 1,178 MI $990 CO		
	Company productivity loss (assumes multiplier of 1.44) (IN)	$2,140 CO $2,541 MI $2,750 CA $3,191 MA		
Visit 3	CPT 99214 (E/M) (D)	$280 CO $167 CA $147 MA $136 MI		

Chronology	**MRI**		**IDA**	
	Patient co-pay (D)	$88 CA		
	Patient time – only if worker's comp not applicable (2 hrs.) (IN)	$73 CA		
Total cost (D+IN)		$12,430 MA $11,996 CA $10,478 MI $9,464 CO		$1,203 MA $1,028 CA $936 MI $1,612 CO

CA=California; CO=Colorado; D=Direct cost; E/M=evaluation and management; IN=indirect cost; MA=Massachusetts; MI=Michigan; MRI= magnetic resonance imaging.

Appendix Table 2: Variables used in TreeAge Pro model

NAME	DESCRIPTION	FORMULA	VALUE	LOW	HIGH	COMMENT
Average_hourly_pay_in_minutes	National average hourly pay - on a per minute basis	$0.61	$0.61	$0.00	$0.70	Bureau labor statistics - national average hourly pay plus benefits, May 2019; $36.63. Accessed on June 17, 2019 at: https://www.bls.gov/news.release/empsit.t19.htm $27.83/60 = $0.464 cents per minute
CPT_29870	NA knee office setting	$708.34	$708.34	$0.00	$1,750.00	Private payment amount Loma Linda
CPT_73721	MRI knee without contrast	$1,220.64	$1,220.64	$0.00	$1,500.00	Data from Loma Linda orthopedic practice; private payer.
CPT_99203	New patient visit E/M for knee or shoulder pain - 30 minutes	$196.34	$196.34	$0.00	$196.34	Data derived from Loma Linda orthopedic practice; private payer.
CPT_99204	New patient visit knee or shoulder pain E/M of 45 minutes	$320.00	$320.00	$0.00	$10,000.00	Data derived from Loma Linda orthopedic practice; private payer.
CPT_99214	Follow up E/M visit post MRI with physician - existing patient; 25 minutes	$167.45	$167.45	$0.00	$167.45	Data derived from Loma Linda orthopedic practice; private payer.
MRI_wait_time_weeks	MRI wait time in weeks	2.4	2.4	0	2.4	Estimate of waiting time in weeks to undergo an MRI - survey from Loma Linda.
OOP_Cost_visit	Average out of pocket cost orthopedic visit	$88.00	$88.00	$0.00	$88.00	Average out of pocket cost for an orthopedic visit, 2016. Medical Expenditure Panel Survey. Statistical Brief #517: Expenses for office-based physician visits by specialty and insurance type. 2016. Accessed on 6/17/19 at: https://meps.ahrq.gov/data_files/publications/st517/stat517.shtml
Productivity_loss_multiplier_2weeks	Productivity loss multiplier for 2 week period	1.61	1.61	0	1.61	Cost of work productivity loss for absence as a proportion of daily wage over a 2 week period = 1.61. Nicholson S, Pauly M, Polsky D, et al. Measuring the effects of work loss on productivity with team productiu. Health Econ. 2006;15:111-123

NAME	DESCRIPTION	FORMULA	VALUE	LOW	HIGH	COMMENT
Productivity_loss_multiplier_short_term	Productivity loss multiplier over a 3 day period	1.44	1.44	0	1.44	Cost of work productivity loss for absence as a proportion of daily wage over a 3 day period = 1.44. Nicholson S, Pauly M, Polsky D, et al. Measuring the effects of work loss on productivity with team production. Health Econ. 2006;15:111-123
Temp_Diability	Amount per week in temporary disability	Temporary_disability	$594.00	$0.00	$594.00	
Time_physician_visit	Time in minutes for visiting a physician - travel time and clinic time	Time_per_visit	115.33	0.00	125.00	
Wait_time_FU_visit_post_MRI	Wait time in weeks for a follow up visit orthopedic surgery post MRI	Wait_time_FU_visit	1.71	0.00	2.00	
Wait_times_total		Wait_time_FU_visit_post_MRI+MRI_wait_time_weeks	4.11	0.00	4.00	
Weekly_wage	Average weekly wage California	906	$906.00	$0.00	$500.00	San Bernadino County, CA, average weekly wage
Workers_comp_week	Workers compensation amount	604	$604.00	$0.00	$500.00	Workers compensation 2/3rd of weekly average wage; San Bernadino County, CA, $906/week; $604/week

Distributions used in TreeAge Model:

NAME	DESCRIPTION	TYPE	PARAMETERS	EV	COMMENT
Wait_time_FU_visit	Orthopedic wait time in weeks for follow up results MRI	Normal	mean: 1.71, stddev: 0.71	1.71	Sources: Penn M, et al. Comparison of wait times for new patients between the private section and the US Dept Veterans Affairs medical centers. JAMA Netw Open. 2019;2(1):e187096. Wiznia DH, et al. The influence of medical insurance on patient access to orthopaedic surgery sports medicine appointments under the ACA. Ortho Jr Sports Med. 2017;5(7)
Time_per_visit	Time per visit includes clinic and travel time in minutes	Triangular	min: 112, likeliest: 115, max: 119	115.33	Source: Ray KN, et al. Opportunity costs of ambulatory medical care in the United States. AJMC. 2015;21(8):567-574.
Temporary_disability	Temporary disability for San Bernadino County	Uniform	subtype: 2, low: 554, high: 634	594	Temporary disability per week is 60-70% of an individual's wages. Individual wages are $906/week. Therefore $544 - $634/week

Appendix Table 3 – sensitivity analysis for private pay – knee pathology:

Variable	Pricing of IDA	Value at which IDA was the more costly alternative
Wait time MRI (0-2 weeks)	$1,750	<1.2 days (CA); <2.1 days (CO); <2.5 days (MA) <2.8 days (MI)
Wait time F/U MRI –office visit (0-2 weeks)	$1,750	<1.2 days (CA); <2.1 days (CO); <2.5 days (MA) <2.8 days (MI)
Workers comp/week ($0 - $500)	$1,750	<$75 (CA); <$150 (CO); <$200 (MI); <$240 (MA)
Weekly wage ($0 - $500)	$1,750	<$50 (CA); <$100 (CO); <$140 (MI); <$150 (MA)