

**Supplementary Table 1. Patient Summary, Treatment, and Outcomes<sup>a</sup>**

Author	Age/Sex	Patient History	Primary Lung Mass Size	Lung Cancer Subtype	Cancer Stage	Metastasis Sites	Cancer Treatment	TLS Etiology (Tx-induced or Spontaneous)	TLS Prophylactic Agents	TLS Therapy	Response to TLS Treatment	Time to Diagnose TLS (Days)	Survival Status After TLS	Time from Diagnosis to Death (Days)	Cause of Death
Stuart et al. [37]	NA/M	History of 3 acute seizures.	NA	Bronchogenic adenocarcinoma	IV	Bilateral pulmonary nodules	28 days prior he had ceritinib and had palliative radiotherapy 3 days prior	Tx-induced	NA	Rasburicase and IVF Insulin, dextrose, sodium bicarbonate	Electrolytes stabilized and acute kidney injury resolved	1	Alive	NA	NA
Shenoy et al. [35]	74/M	Oliguria. Recently diagnosed SCC, had not yet started treatment.	NA	Squamous cell carcinoma of lung	IV	NA	NA	Spontaneous	NA	Hemodialysis, IVF, allopurinol	Renal dysfunction resolved after 3 days and uric acid normalized	1	Alive	NA	NA
Sewani et al. [34]	55/M	Presented with right upper quadrant pain and fever. Diagnosed with metastatic mixed small cell and non-small cell lung cancer 1 day prior. Developed septic shock due to listeria.	3 cm spiculated mass in right middle lobe	SCLC, also NSCLC present (mixed)	IV	Liver, lymph node	Etoposide, BAY 12-9566 (matrix metalloproteinase inhibitor), carboplatin, and paclitaxel	Tx-induced	NA	IVF and urine alkalization	Death after 5 days with withdrawal of support	NA	Dead	5	Multiorgan failure
Kurt et al.[29]	52/M	Recently diagnosed metastatic lung adenocarcinoma, admitted for chemotherapy but found to have gram-negative septicemia. Received zoledronic acid for hypercalcemia and subsequently developed acute renal failure (zoledronic acid thought to be an inciting factor).	8 cm mass in right pulmonary hilum, 1 cm mass on left frontal lobe, 3 cm mass in paraspinal region, 7 cm mass adjacent to caudate lobe of liver	Adenocarcinoma	IV	Brain, bone, liver, small intestine	NA	Tx-induced	NA	IVF, allopurinol, bicarbonate	Death from septic shock approximately 3 weeks after admission	1	Dead	NA	Gram-negative septicemia
Noh et al. [31]	52/M	Oliguria and dyspnea after initiation of palliative radiotherapy for lung SCC.	10 cm mass in central portion of the right upper lobe	Squamous cell carcinoma of lung	NA	NA	Radiation	Tx-induced	NA	IVF, furosemide, and urine alkalization, hemodialysis	Progression to anuria with worsening lab values	NA	Dead	NA	TLS induced electrolyte abnormalities and anuria
Dhakal et al. [11]	~70/M	Back spasms, oliguria, fatigue, leg swelling for 2 weeks. Found to have bronchogenic carcinoma and AKI on admission	NA	SCLC	IV	Liver	NA	Spontaneous	NA	IVF, rasburicase, daily allopurinol, hemodialysis	Developed anuria, continued dependence on hemodialysis, developed encephalopathy with visual hallucinations in addition to lower gastrointestinal bleed, cyanosis with mottling of abdomen and extremities.	1	Dead	NA	Multiorgan failure
Ohmishi et al [13].	67/M	2 month history of chest pain and back pain, workup revealing SCLC with extensive bone metastases	NA	SCLC	IV	Hilar/subcarinal lymphadenopathy, bone	Cisplatin and etoposide	Tx-induced	NA	Allopurinol and IVF and urine alkalization	Resolution of metabolic abnormalities	2	Alive	NA	NA
Padhi and Singh [12]	73/F	Cachectic, ascites, dyspnea and cough, abdominal distention	Right upper lobe mass of approximately 4 cm with right hilar and mediastinal lymphadenopathy	SCLC	IV	Liver	NA	Spontaneous	NA	IVF	NA	4	Dead	1	Acute respiratory failure secondary to bronchial obstruction
Kanchustambha m et al. [16]	53/M	Shortness of breath, cough, and lower	Left lower lobe mass 10.5 x 5.7 cm	SCLC	III	Lymph nodes	NA	Spontaneous	NA	IVF, Allopurinol and rasburicase	Normalization of electrolyte	1	Alive	NA	Improved after chemo and

		extremity swelling for weeks prior to admission, CT scan revealing large mass left lower lobe of the lung compressing left mainstem bronchus with post-obstructive atelectasis									derangements within 48 hours				radiation treatment
<i>Vanhees et al. [38]</i>	62/M	History of squamous cell lung carcinoma and lobectomy one year prior presenting for anorexia, weight loss and hemoptysis. Workup revealing SCLC. Pt developed SIADH and hyponatremia only after the first two chemotherapy sessions, suspected to be the result of release of ADH from tumor cells.	NA	SCLC	Limited disease	NA	Chemo with vindesine, ifosfamide, and cisplatin	Tx-induced	NA	Fluid restriction	Resolution of hyponatremia	1	Alive	NA	NA
<i>Baumann et al. [18]</i>	78/M	Oliguria with hyperphosphatemia, hyperuricemia after induction of chemotherapy for metastatic SCLC	NA	SCLC	IV	Liver and bone	Doxorubicin, cyclophosphamide, and vincristine	Tx-induced	NA	IVF, Allopurinol, urine alkalinization	Resolution of electrolyte abnormalities	NA	Alive	NA	NA
<i>Saintigny et al.[33]</i>	49/M	Drowsiness after initiation of chemotherapy for newly diagnosed SCLC. Sodium 116 and ADH inappropriately at 5.7, consistent with SIADH. Recurred with cycle 2 and cycle 3, although without clinical symptoms.	NA	SCLC	IV	Hepatic, right adrenal, bone	Etoposide and cisplatin	Tx-induced	NA	Water restriction	Sodium corrected and patient's drowsiness resolved	1	Alive	NA	NA
<i>Shin et al. [36]</i>	49/M	Postoperative lightheadedness, AKI and electrolyte derangements after surgical resection of carcinoid tumor of the lung	5.3x4.2x4.2 cm right infrahilar mass centered in the right lower lobe of lung	Typical carcinoid tumor	II	NA	Surgery to remove tumor	Tx-induced	NA	Insulin, dextrose, albuterol (hyperkalemia), Allopurinol and sodium polystyrene sulfonate, IVF	Electrolytes normalized in days, and had postoperative pericarditis	1	Alive	NA	NA
<i>Hussein et al.[25]</i>	57/M	2 months of diplopia with proptosis/exophthalmos, subcutaneous nodules. Lymphadenopathy. Found to have metastatic SCLC with diffuse metastatic disease to subcutaneous tissue and lymphatics along with retrobulbar mass	NA	SCLC	IV	Subcutaneous tissue, adrenals, left retrobulbar area, and cervical/thoracic/pelvic adenopathy	Cyclophosphamide, doxorubicin, and vincristine intravenously	Tx-induced	NA	Allopurinol, IVF, and sodium bicarbonate	Successfully reduced creatinine and uric acid after 6-8 days, drop in phosphorus with increase in calcium. Tolerated subsequent round of chemo without issue	4	Alive	NA	NA
<i>Vogelzang et al. [39]</i>	57/F	Respiratory distress after initiation of chemotherapy for SCLC. Developed cardiac arrest shortly thereafter	NA	SCLC	IV	Liver, bone marrow, adrenal glands, kidney, thyroid, mediastinal lymph nodes, abdominal lymph nodes	Doxorubicin, etoposide, cisplatin intravenously initially, and 2 days later vincristine.	Tx-induced	NA	Allopurinol, IVF	NA	1.5	Dead	NA	Cardiac arrest
<i>Ajzensztejn et al [17].</i>	65/M	Found to have stage II adenocarcinoma, but poor pulmonary reserve	4 cm opacity left lung	Moderately-differentiated	IV	Lymph nodes, hepatic, adrenal, renal	Docetaxel	Tx-induced	NA	NA	NA	3	Dead	1	Hyperkalemia and acute renal failure

		(hx of smoking, COPD) led to inoperable status. Cancer progressed to stage IV despite chemotherapy. Started on 2nd line docetaxel. Drowsiness, breathlessness, hypotension, and acute renal failure ensued. Patient expired from TLS 24 hours later		adenocarcinoma											
<i>Honda et al. [23]</i>	61/M	3 month history of anorexia and weight loss presenting with hepatomegaly, found to have 3cm RUL lung mass with hilar lymphadenopathy in addition to multiple metastatic tumors to the liver compressing the IVC	3 cm mass in right upper lung field	Lung adenocarcinoma	IV	Contralateral lung, mediastinal lymph nodes and liver	Carboplatin, paclitaxel, and bevacizumab	Spontaneous	NA	NA	NA	1	Alive	NA	Survived TLS, but died after 2 cycles of chemotherapy due to underlying malignancy
<i>Boikos et al. [20]</i>	70/F	Initiated on cisplatin plus etoposide for SCLC, on day 8 cycle 1 labs confirmed TLS. Patient without new symptoms at diagnosis.	Posterior mediastinal mass was 74x60mm in transaxial dimensions and 114x18mm in coronal dimensions	SCLC	Limited disease	NA	Cisplatin etoposide	Tx-induced	NA	IVF, Allopurinol and rasburicase	Improved renal function. Discharged after 3 days. Had a decreased mediastinal mass.	8	Alive	NA	NA
<i>Jallad et al. [26]</i>	75/F	Oliguria, dyspnea, fatigue, decreased appetite, increased abdominal girth. Found to have metastatic SCLC to the liver	NA	SCLC	IV	Liver	NA	Spontaneous	NA	NA	Refused intervention	1	Dead	4	Electrolyte abnormalities and acute renal failure
<i>Kallab et al. [28]</i>	61/M	Lethargy, tachycardia, oliguria, and hypotension following chemotherapy for SCLC. Labs consistent with TLS, EKG with peaked T waves. Patient expired soon after presentation.	CT showed 9x11cm mass in left upper lobe encasing left upper bronchus and pulmonary artery	SCLC	IV	Metastatic tumors in left adrenal, splenic hilum and liver	Cisplatin and etoposide	Tx-induced	NA	NA	NA	4	Dead	NA	TLS
<i>Heching et al. [15]</i>	67/M	SCLC with hepatic metastases developing TLS with acidosis and respiratory distress 24 hours following initiation of chemotherapy	NA	SCLC	IV	Liver	Lomustine, methotrexate, and cyclophosphamide,	Tx-induced	NA	NA	NA	1	Dead	2	Renal failure, profound acidosis, respiratory distress
<i>Beriwal et al. [19]</i>	68/F	Diagnosed with SCLC metastatic to retroperitoneal lymph nodes, liver, ribs. Was given IVF, allopurinol, urine alkalization on admission due to hyperuricemia and prerenal azotemia. Developed oliguria, acidosis in setting of TLS after chemotherapy one day prior. Proceeded to develop shock, disseminated intravascular	NA	SCLC	IV	Liver, bone, and lymph node	Topotecan	Tx-induced	IVF, allopurinol and urine alkalization	Allopurinol, phosphate binding resin, IVF, and alkalization of urine	Developed hypoxemia and needed mechanical ventilation for respiratory support	1	Dead	4	Hypotensive shock and disseminated intravascular coagulation secondary to sepsis with multiorgan failure

		coagulation, sepsis, multiorgan failure.													
<i>Kalemkerian et al. [27]</i>	74/F	Lethargy, tachycardia, tachypnea, hypotension, acidosis 3 days following initiation of chemotherapy for SCLC	NA	SCLC	IV	Mediastinal Lymph nodes, bone	Cisplatin and etoposide	Tx-induced	NA	IVF, sodium bicarbonate, forced diuresis	Mental status and hemodynamics improved	2	Alive	NA	Improved after treatment for TLS
<i>Marinella et al. [30]</i>	52/M	Imaging revealed R hilar mass with multiple liver nodules and adrenal masses, biopsy confirming SCLC. Initial uric acid 6 and was started on allopurinol and IVF before chemotherapy. Developed lethargy, melena, hematochezia following chemotherapy, labs revealed TLS. Autopsy revealed gastric ulcer.	NA	SCLC	IV	Liver and adrenals	Cisplatin and etoposide	Tx-induced	Allopurinol	Allopurinol and IVF and sodium bicarbonate	NA	2	Dead	3	Tumor lysis of gastric wall metastasis leading to massive gastrointestinal bleed
<i>Mott et al. [14]</i>	76/F	Found to have left upper lung mass and numerous liver lesions. Four days after initiation of chemotherapy, patient developed nausea and dehydration, lab work consistent with TLS.	NA	SCLC	IV	Liver	Carboplatin and etoposide	Tx-induced	NA	Allopurinol, IVF, and urine alkalization	NA	4	Alive	NA	NA
<i>Persons et al. [32]</i>	38/F	Disorientation and dyspnea following chemotherapy for NSCLC, diagnosed with acute renal failure in setting of TLS in the ED.	CT confirmed: 3cmx4cm left supraclavicular mass, 1.5cm x 2 cm left axillary lymph node	Adenocarcinoma	IV	Lymph nodes	Cisplatin and irinotecan	Tx-induced	NA	Allopurinol, Bicarbonate, IVF	Improved	12	Alive	NA	NA
<i>Feld et al. [22]</i>	72/M	Presented with fatigue, weakness, anorexia, dyspnea, cough, abdominal girth, night sweats, fever, weight loss. Diagnosed with lung adenocarcinoma and multiple liver metastases. Developed spontaneous TLS on hospital day 4.	NA	Adenocarcinoma	IV	Liver	NA	Spontaneous	NA	Potassium and phosphate binders, calcium gluconate, allopurinol, IVF	Refused intervention after clinical deterioration	3	Dead	4	TLS
<i>Hong [24]</i>	59/M	Diagnosed with metastatic disease involving thoracic lymph nodes, scapula, and brain. EGFR exon 19 deletion identified; started on afatinib. Developed oliguria, worsening dyspnea in the setting of TLS. Refractory to fluids, furosemide, sodium bicarbonate, and continuous renal replacement therapy	3.3 x 3.0 cm	Adenocarcinoma	IV	Lymph nodes, MS, brain	Afatinib	Tx-induced	None	IVF, sodium bicarbonate, furosemide, 'specific interventions for hyperuricemia and hyperkalemia'; continuous renal replacement therapy	Death	1	Dead	1	TLS
<i>Causbie et al. [21]</i>	58/M	Presented with right hip/thigh pain and destructive bony lesion on MRI, discharged with follow-up. Returned 4	6.2 x 2.1 cm	Squamous cell carcinoma	IV	MS, lymph nodes	None	Spontaneous	None	Rasburicase, continuous renal replacement therapy	Survival with resolution of electrolyte derangements	1	Alive	NA	NA

		days later with a new fracture and lab findings of TLS. CT showed a right hilar lesion, and biopsy of the thigh mass revealed squamous cell carcinoma.												
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*^*TLS tumor lysis syndrome; *SCLC* small cell lung carcinoma; *NSCLC* non-small-cell lung carcinoma; *SCC* squamous cell carcinoma; *IVF* intravenous fluids; *SIADH* syndrome of inappropriate antidiuretic hormone secretion; *AKI* acute kidney injury; *EGFR* epidermal growth factor receptor; *CT* computed tomography; *MRI* magnetic resonance imaging; *MS* musculoskeletal; *Tx-induced* treatment-induced; *NA* not available

## Supplemental Figure 1. PRISMA Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	N/A; see notes
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 4
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pages 4-5
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 4
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 4
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 4-5
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Pages 5-6
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Pages 5-6
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 5-6
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NA; see notes
Synthesis	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention	Pages 4-6

Section and Topic	Item #	Checklist item	Location where item is reported
methods		characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pages 5-6
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pages 6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Pages 6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	N/A; see notes
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 5-6
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA; see notes
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Figure 1.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Table 1, page 6
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Page 10-11
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pages 7-10; see Tables 1-3
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	See #18
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pages 8, 10, see Table 2
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	N/A
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Page 10-11

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	N/A, refer to #15
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 11-15
	23b	Discuss any limitations of the evidence included in the review.	Page 16
	23c	Discuss any limitations of the review processes used.	Page 16
	23d	Discuss implications of the results for practice, policy, and future research.	Page 14-16
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 1
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 1
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 1
Competing interests	26	Declare any competing interests of review authors.	Page 1
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 1

**Notes:**

1. The study was classified as a literature review

12. The study was a review of case report observations, synthesis based on intervention/exposure was not applicable

13e. The included studies consisted primarily of individual case reports with significant variability in reporting formats, patient populations, and outcome measures.

15. This review did not warrant formal certainty assessment due to focus on summarizing case reports, risk of bias assessment was performed for appraisal of included articles